

Playing with plug-ins? We tested a dozen browser enhancements and identified six you just gotta have. Buyer's Guide, page 81

# COMPUTERWORLD

The Newsweekly for Information Technology Leaders  
News updates, features, forums: [www.computerworld.com](http://www.computerworld.com)  
April 7, 1997 • Vol. 31 • No. 14 • 124 pages • \$3/Copy \$48/Year

## Wireless 'net access spreads

Dial-up service said cheaper than T1 lines

By Mitch Wagner  
and Mindy Blodgett

WIRELESS ACCESS to the Internet is becoming more widely available for mobile users and

companies.

The current wave of services offers wireless access at dial-up speeds and will be followed later this year by high-speed services.

The technology was designed for notebook computers and handheld devices on the low end, and to connect entire build-

ings to the Internet or corporate intranets on the high end.

WarpDrive Networks, Inc. in San Jose, Calif., next week plans to announce beta-testing of a wireless Internet service slated for general availability in San Jose and Seattle by June and in

Wireless access, page 16

### INSIDE THIS ISSUE

### TALE OF THE VIRTUAL TAPE

IBM, StorageTek products to maximize tape storage. Next page

### ALPHA USERS APPLAUD NT 5.0

Microsoft's Active Directory addresses shortcomings. Page 2

### 3Com goes gaga for Giga

Users cite limitations blocking Gigabit Ethernet. Page 4

### MICROSOFT OFFERS TOUR OF MEMPHIS

WinHEC '97 show to debut next version of Win 95. Page 9

## Gotcha! Monitoring tools track Web surfing at work

By Sharon Machlis

DO YOU KNOW where your Web surfing are?

In a bid to control corporate network resources, systems administrators are turning to a new wave of products designed to monitor what users are doing on the Internet.

The programs can track

which uniform resource locators users visit, the files they download and even the search terms they type in at sites such as Yahoo, Inc.'s namesake search site and Digital Equipment Corp.'s AltaVista.

The monitoring is aimed at preventing workers from frittering away hours planning vaca-

Monitoring tools, page 16

## Java's speed, cross-platform issues targeted

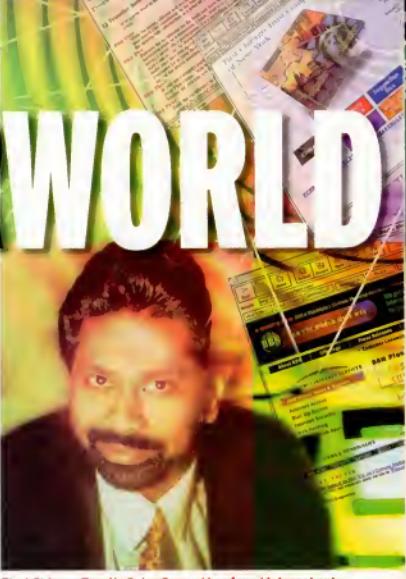
By Sharon Gaudin  
SAN FRANCISCO

JAVA IS TOO SLOW. It isn't mature enough. And there are glitches in its much-touted cross-platform compatibility.

As much as Sun Microsystems, Inc.'s programming language has won the computer industry by storm, those nagging worries have kept it from becoming a serious contender for mission-critical applications.

But Sun last week made it clear at its JavaOne conference here that it is making a major

Sun, page 113



First Chicago Trust's Sajoo Samuel has found Internet outsourcing successful. But users and outsourcing experts say the practice poses potential hazards as well.

## 'net outsourcing a risky proposition

By Gary H. Anthes

YOU JUMPED ON the outsourcing bandwagon long ago, farming out data center management, telecommunications, disaster recovery, legacy systems maintenance and a few other things.

Now you're getting into the Internet game, so you might as well send that out the

door as well, right?

Not so fast, some users and outsourcing experts say. There are things about the Internet that make outsourcing difficult and risky. The technology is changing at an explosive rate, the direction of emerging markets is unclear, and your company's strategy for electronic commerce may not be well-defined.

Outsourcing the 'net, page 74

If the world's most powerful military force can't keep hackers out of its computer systems, who can? The consensus seems to be nobody. But there are steps the military — and the private sector — can take to reduce the risks (see story, page 6).

Those attacked often call the Computer Emergency Response Team's hot line. We visited and listened in.

In Depth, page 87





*"You've got a friend in the business."*

1. Follow instructions on the other side

BACK

QPS5184AK-0018

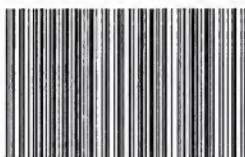


Inverted Back

1. Follow instructions on the other side

Foldout slip-sheet

GR3515SHEET-001



Inverted Foldout slip-sheet

1. Open the foldout page

2. Insert this sheet with

1. Front side touching the free page

2. Arrow pointing to the fold

3. Slice the folded edge

4. Close the page and slip-sheet



1. Open the foldout page
2. Insert this sheet with
3. Arrow pointing to the fold
4. Close the page and slip-sheet

3. Slice the folded edge

2. Arrow pointing to the fold

1. Front side touching the free page

2. Insert this sheet with

3. Arrow pointing to the fold

4. Close the page and slip-sheet

Folded edge of the page



Back Row: Darr "Dawg" Hildahl, Kandi "Three Pointer" Ackerly, Rob "Give 'Em" Holt

Front Row: Scott "Slapshot" Smith, Joyce "Long Ball" Dusel, Cindy "Bicycle Kick" Edna Buly "Hang Time" Miller, Coach Bill Shea.

"Grrr Impressive" Musselman

Saved By The Bell.

Our game plan  
Put a full-court  
press on the  
field for you  
never quit  
when it comes  
to service. And  
always remember  
calling the  
number  
our customers.

Coach Bill Shea  
Vice President  
Major Account

### Professional P5-133 System

- Intel® 133MHz Pentium® Processor
- 16MB EDO DRAM
- 256K Pipelined Burst Cache
- Vivitron® 500 26dp Monitor (13.9" viewable)
- 2MB SGRAM, 3-D 64-Bit PCI Graphics
- 1GB 11ns EIDE Hard Drive
- 12X CD-ROM & 3.5" Diskette Drives
- 104® Keyboard & Microsoft® IntelliMouse™
- MS® Windows® 95
- MS Office 97, Small Business Edition plus Bookshelf '96
- Gateway Gold™ Service and Support for Desktops

**\$1529** \*Business Lease \$56/mo.

### Professional P5-166 System

- Intel 166MHz Pentium Processor
- 16MB EDO DRAM
- 256K Pipelined Burst Cache
- Vivitron® 600 26dp Monitor (15.9" viewable)
- 2MB SGRAM, 3-D 64-Bit PCI Graphics
- 2GB 11ns EIDE Hard Drive
- 12X CD-ROM & 3.5" Diskette Drives
- 7-Bay Mini Tower Case
- 104® Keyboard & MS IntelliMouse™
- MS Windows 95
- MS Office 97, Small Business Edition plus Bookshelf '96
- Gateway Gold™ Service and Support for Desktops

**\$1979** \*Business Lease \$73/mo.

### Professional G6-200 System

- Intel 200MHz Pentium® Pro Processor
- 32MB EDO DRAM
- 256K Internal Cache
- Vivitron® 600 26dp Monitor (15.9" viewable)
- 2MB SGRAM, 3-D 64-Bit PCI Graphics
- 2GB SCSI Hard Drive with Controller
- 12X SCSI CD-ROM & 3.5" Diskette Drives
- 3Com® 10/100 PCI Ethernet Adapter
- 12-Bay Tower Case
- 104® Keyboard & MS IntelliMouse™
- MS Windows NT® 4.0
- MS Office 97, Small Business Edition plus Bookshelf '96
- Gateway Gold Service and Support for Desktops

**\$3049** \*Business Lease \$112/mo.

### So

- 11.3" TFT
- Intel 166MHz
- 16MB SDRAM
- Zoomed Internal Cache
- 1MB Hard Drive
- 1GB Hard Drive
- Modem
- Modem
- 16-Bit AGP
- NIMI
- 85.4-KHz
- Carry
- MS Windows
- Gateway

**\$2999**



"You've got a friend in the business."™



Technology threatens to crush Edward Blanco's hospital network. The Enterprise Network, page 55



Exit interviews can give IS managers insights into their managing style. Careers, page 90



Late and over budget, the Swiss Exchange still sets the standard, says Juerg Spillmann. Corporate Strategies, page 69

## In this issue

### NEWS

#### 3 Mixing host storage

Amdahl software to swap data among storage arrays from different vendors.

#### 8 Floundering upgrade

Glitches in payment system upgrade leave health care firm owing millions.

#### 12 Common demands

AS/400 user group task force set to go to IBM with its data warehousing needs.

#### 14 Active Web management

Tabletron promises to use Java, CORBA to expand Web support in net management tools.

#### 32 Unexpected loss

Informix users are confident despite whopping quarterly loss that dims the outlook for Universal Server.

### OPINION

#### 34 Mistaken mission

Laptop vendors are missing the boat on user needs and may get left behind, James Connolly predicts.

#### 35 Watch out!

Guerrilla "intranettes" are popping up all over large organizations, and you will have to deal with them, Michael Schrage warns.

#### 78 Looking honest

IS executives must remove potential conflicts of interest among staff members who make buying decisions, Leilani Allen writes.

### TECHNICAL SECTIONS

#### SERVERS & PCs

#### 43 Strengthening nets

Mixing smart cards with network computers may make both more appealing.

#### 43 Win CE Outlook

Microsoft will link its handheld operating system to Exchange, Excel and Outlook.

#### SOFTWARE

#### 49 Work smarter

Sears Canada built a business analysis system to revive plummeting sales.

#### 49 Year 2000

IBM aims a new package of tools at year 2000 problem on mainframes.

#### THE ENTERPRISE NETWORK

#### 55 Mix or mess?

GroupWise users have mixed feelings about Novell's alliance with Netscape.

#### 55 Migration assistance

Vendors aim software distribution tools at users moving to Windows NT clients.

#### THE INTERNET

#### 63 Information access

Arthur Andersen intranet puts all its expertise in the hands of consultants.

#### 63 NetWare/Internet gateway

Novell pushes Internet package as gateway from NetWare to elsewhere.

#### 63 56K bit/sec. modems grow

Some Internet service providers adopt fast modems faster than others.

#### CORPORATE STRATEGIES

#### 69 Cross-industry cooperation

Despite being in different industries, two firms share training resources.

#### 69 SSA online

In what may be a first for the federal government, the Social Security Administration offers benefits data online.

#### FEATURES

#### MANAGING

#### 77 Grab bag

Resources for IS managers: Bookshelf, Web sites, conferences.

#### CAREERS

#### 91 AS/400 takes off

Salaries for skilled AS/400 users are on the rise, and more so for men.

#### ETC.

Company index	111
Editorial/Letters	34
F.Y.I.	78
How to contact CW	111
Inside Lines	116
Stock Ticker	110

# 'Virtual tape' crams in data, cuts storage costs

By Tim Ouellette

**D**ATA CENTER managers soon will be able to pack data more efficiently into tape systems, saving floor space and storage budgets in the process.

High-end tape storage competitors IBM and Storage Technology Corp. are developing "virtual tape" products, which are supposed to stop users from worrying about how much data is in each tape cartridge. Products won't appear until the summer.

Virtual tape technology completely fills each tape cartridge in a tape library. Currently, users might fill only a small portion of each tape because of volume constraints.

More efficient use of tape storage means users can reduce the number of new tape cartridges, drives and libraries they need to fulfill rising storage requirements.

"This is exactly what we need to save space on the library floor," said Russ Archibald,

dress of a tape cartridge, no matter how much space is used.

Disk arrays have shrunk while storing more data, but tape systems haven't kept up, even though more data — three times more, according to some industry estimates — is stored on tape than on disk, analysts said.

IBM's Virtual Tape Server (VTS), due to ship in June, will be the first product to address that issue. StorageTek's Virtual Storage Manager (VSM) won't be available until next year (see chart).

Both products will use disk arrays to cache mainframe data before moving it to tape. But the mainframe will see the disk array as a typical tape library.

IBM's VTS systems use a hardware controller that can reside on IBM's 3494 Magstar tape libraries and don't require any changes to mainframe software applications. Prices will range from \$215,000 to \$250,000, not including the additional tape drives and tape

### TALE OF THE TAPES

#### Features of upcoming virtual tape management products

##### IBM's VTS

##### StorageTek's VMS

Hardware controller

Host software to support VMS

RAID disk array

Ramac (formerly Iceberg) disk array

Magstar tape libraries, drives and cartridges

Near-line tape libraries and related drives and cartridges

Storage management software derived from IBM's ADM backup package

director of technical services at MCI Communications Corp. in Colorado Springs. MCI runs 86 StorageTek tape libraries across its many data centers.

Today's tape storage management is too manual-intensive, which makes it more expensive, Archibald said.

IBM and research firm International Data Corp. in Framingham, Mass., estimate that only about 10% of each data center's tape cartridge is filled with data. Mainframe applications and tape systems allocate data to tape in volumes. Although volumes can vary in size, they take up the complete location ad-

libraries that will be packaged with VTS.

With VTS, users can house the same amount of data in one of IBM's new high-capacity Magstar 3590 cartridges as they currently house in 50 3490 cartridges, IBM officials said. User savings could run as high as \$280,000 for the cartridges alone.

StorageTek's VSM is made from proprietary technology that company officials claim will provide better performance than VTS, using more high-speed Escan channels and disk compression found in the Ramac Virtual Array. □

## UP FRONT

## Info-flap

Last week I had a harrowing introduction to the power of the Internet to spread misinformation.

It started on a Sunday, when a senior Oracle executive read a *Computerworld* article that was sent to him by an electronic news service. The article was a glowing endorsement of Oracle's Universal Server strategy.

Pleased with the positive publicity, the executive forwarded the article to other executives at Oracle. They, in turn, sent it to Oracle's marketing and salespeople around the world.

By midweek, hundreds, perhaps thousands of Oracle employees had seen the article. So had their customers. Calls were coming in to our editorial office from customers wanting to know if the story was true.

It wasn't.

At least, not the way it was presented. The article appeared as part of a *Computerworld Sound Off* debate under the byline of Jerry Held, an Oracle senior vice president. It was balanced with an opposing opinion from an Informix official. Somewhere in the translation from print to electrons, the bylines were swapped, and Oracle's opinion looked like our opinion.

Oracle sent out a clarification, Informix got a letter from us, and I earned a few more gray hairs. But I also learned the hard way about the power of the Internet to deceive.

Nearly all our communications these days are digitized at some stage. Once information is digital, it can be copied, edited and distributed globally at the touch of a button. The Internet can be a wondrous publishing tool. But it can also be like the kids' game of telephone, in which a message is mangled as it's whispered from player to player.

Global E-mail is like publishing, but without the editors. And yes, there are reasons we have editors.

Paul Gillin, Editor  
Internet: paul\_gillin@cw.com

## THE FIFTH WAVE

BY RICH TENNANT



"HOLD ON, THAT'S NOT A PROGRAM ERROR. IT'S JUST A BOOGER ON THE SCREEN."

## NT 5.0 rates a thumbs-up

► Early users like new features of Active Directory

By Laura DiDio



ALPHA TESTERS are lauding the increased functionality in the forthcoming Windows NT 5.0 and its new Active Directory. This is despite the fact that they won't get their hands on the product until the middle of next year (see story at right).

Unlike the upgrade from NT 3.51 to NT 4.0, in which the main new feature was the Windows 95 user interface, Windows NT 5.0 will provide businesses with a slew of advanced functions. Those include the Active Directory, which will eliminate the limitations of the Domain directory and deliver a true enterprise database with centralized management; Java support; and caching capabilities.

## EASE OF USE CITED

Among the dozen enterprise users polled by *Computerworld* was Ron Milione, chief of technology at Integrated Systems Group in Hauppauge, N.Y., who called NT 5.0's ease of use and setup straightforward.

"Windows NT 5.0 gives me the ability to define users by their roles in the organization," Milione said. For example, NT 5.0 contains a facility, called the Real World User Manager Utility, that lets administrators establish guest user accounts and assign that person to a specific group. "It means I no longer have to manually assign user access rights, which is a big timesaver," Milione said.

Jeff Dazzell, LAN administrator for network services for corporate support at Dana Corp., a \$7 billion automotive parts manufacturer in Toledo, Ohio, said he looks forward to the availability of the Active Directory and Lightweight Directory Access Protocol support. Both of these features will improve management capabilities and Internet access for his 45,000 end users.

Dana has 23 NT 3.51 and 4.0 domains, and the naming conventions are different for each one. "I have no way of knowing where a particular database or CPU resides. The Active Directory will solve that," Dazzell said. But the alpha testers also re-

## Users: Delay is good news

Microsoft's decision to delay Windows NT 5.0 until the summer of 1998 comes as a welcome relief to 11 NT users contacted by *Computerworld* last week.

The users said the respite will provide the breathing space needed to complete installation of NT 4.0 and related hardware upgrades. It will also give Microsoft the time to get Windows NT 5.0 right the first time.

"If Windows NT 5.0 is stable, I want it. But I don't want an operating system that's broken or half-baked," said Kurt Guerrero, network administrator at Northern Trust Co. in Chicago. "It gives me a real laugh that Microsoft is now just shipping a beta release of the Windows NT 4.0 Service Pack 3 software patch. What does that tell you?" he said.

Richard Palmer, a programmer at Texas Instruments, said the chip maker is riding the fence with respect to the NT 5.0 migration. "It will cost us \$100 to \$200 per workstation license for our 30,000 workstations worldwide. That's millions of dollars in upgrade costs and over a year to upgrade. When we look at it that way, we don't mind living with the domain directory and the older versions of Windows NT for another year," Palmer said.

Dan Schuett, lead senior systems programmer at a Chicago paper manufacturing firm with 40,000 users worldwide, agreed. "I'll welcome Windows NT 5.0, but I won't be the first one to install it because Microsoft has a nasty habit of using its consumers as the test bed," he said. — Laura DiDio

a red alert.

"There are definite glitches in [NT 5.0] synchronization during peak usage time and across the WAN links. We've experienced time-outs," Milione said.

Dazzell said problems with replication and synchronization are "showstoppers" that could make network operations grind to a halt. But he said he would prefer that Microsoft hold up the release of Windows NT 5.0 for a year to get it right. "Better that than having to release five service packs to fix the bugs," he said.

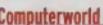
Richard Palmer, a programmer at Texas Instruments, Inc. in Dallas, said he is resigned to the fact that he won't get NT 5.0 for more than a year. Meanwhile, the chip maker is constructing work-arounds that make the Domain directory easier to live with. □



Integrated's Ron Milione:  
Windows NT 5.0 upgrade will  
be 'big time-saver'

ported a major flaw in the pre-release software. The synchronization and replication feature that controls server operations doesn't work properly. Without complete synchronization, users on a Windows NT 5.0 network could be denied access to key resources and find themselves unable to communicate with other users.

Milione and Dazzell called this

Come visit our Web site 

► OUTSOURCING THE 'NET: Farming out some Internet functions can bring rewards, but it entails some unique risks. Senior editor Gary H. Antes discusses the options in a RealAudio Q&A. (www.computerworld.com)

► WINNING AT THE RESUME GAME: Executive search consultant Janice Litvin shows you how to make your resume stand out from the crowd. (www.computerworld.com/careers)

## Daily news updates: (800) 340-2262

\*If you need to know what's going on in the industry but aren't near your PC, get a recorded update at our toll-free number.

# AMD challenges Intel with cheaper MMX chip

► Court says Intel can't claim MMX term

By April Jacobs

**ANALYSTS SAY** end users won't be able to tell the difference between AMD Corp.'s K6 MMX processor, which shipped last week, and archrival Intel Corp.'s Pentium Pro chip.

Except that, is, for the price. AMD said it plans to price its chips at least 25% below comparable Intel offerings (see chart).

AMD's K6 MMX is available in speeds of 233, 200 and 166 MHz. Intel in Santa Clara, Calif., hasn't yet announced a 233-MHz chip.

AMD's K6 MMX is compatible with Microsoft Corp.'s Windows 95, Windows NT and Windows 3.x; Novell, Inc.'s NetWare; IBM's OS/2 Warp; Unix; Sun Microsystems, Inc.'s Solaris; and Banyan Systems, Inc.'s Vines.

AMD didn't gain the K6

MMX designation without a fight.

A federal court last week denied Intel's request for a temporary restraining order to prevent AMD from using the term MMX with the K6.

"Intel thought they could ... subdue competitive threats from AMD and Cyrix. But now that the courts have allowed the use of MMX, it legitimizes a very good technological competitor," said John Dunkle, president of Workgroup Strategic Services in Portsmouth, N.H.

The K6 is extremely well-designed, versatile and fast," Dunkle said. The K6 has the MMX designation and clock

## ORDER IN BULK

AMD's K6 MMX processor is priced in quantities of 1,000 units

166 MHz	\$244
200 MHz	\$349
233 MHz	\$469

speeds that at least equal the Pentium Pro, Dunkle said, so PC users will hardly notice they have an AMD chip.

AMD in Sunnyvale, Calif., said major hardware vendors are evaluating the K6, including Digital Equipment Corp. in Maynard, Mass., Compaq Computer Corp. in Houston, and Hewlett-Packard Co. in Palo Alto, Calif.

But AMD officials wouldn't say when or if machines would appear on the market with the K6 inside. □

# Object Design serves Java to users

By Craig Stedman

**OBJECT DESIGN, INC.** plans this week to release an updated version of its market-leading object database that lets users tap in to Java.

ObjectStore 5.0 adds support for storing native Java objects and for converting C++ server code into client-level Java.

Several prospective buyers said the Java capabilities should speed up their application development chores and make ObjectStore more user-friendly at the client end.

Java is a welcome relief from C++, said Dan Woods, a senior manager of applications development at Time, Inc.'s new-media unit in New York. "With Java, you're not hamstrung by all the ways you can shoot yourself in the foot that C++ presents," he said.

Time uses ObjectStore to run a personalized news service on its Pathfinder World Wide Web site. The new-media operation is writing an all-Java stock-quote application as a test bed for wider use of Java at the server, Woods said.

Burlington, Mass.-based Object Design has turned to the Web after failing to make much of a dent in traditional business applications, which still lean toward relational databases.

Woods and other ObjectStore users said object databases provide better performance and less painful development than

Other new features of ObjectStore 5.0 include support for asynchronous data replication and automatic fail-over to a standby server.

relational software for applications that involve a complex mix of data.

Paul Rogers, a scientific application developer at the Monterey Bay Aquarium Research Institute in Moss Landing, Calif., said he looked at going relation-

# Amdahl eases move of mainframe data

By Tim Ouellette

on one company," said John McArthur, an analyst at International Data Corp. in Framingham, Mass.

Indeed, users at recent conferences have said that having a mix of storage systems in a data center helps them broker better deals and keep competition alive.

## MORE OPTIONS

Data migration lets users move subsets of their databases to different machines.

"People want continually tell me they want more than one vendor's storage devices in their data centers, since they don't want to bet all future functions

al for an upcoming intranet application that will store data about ocean creatures. But mapping the data in relational tables would have been 'daunting,' and the institute's scientists want to run hierarchical queries that relational databases 'just struggle with,' Rogers said. Instead, he is relying on Java objects and ObjectStore 5.0.

The new release is available now on Windows NT and Sun Microsystems, Inc.'s Solaris operating system. Pricing starts at \$3,800. □

# CIO dispenses network computers to reduce swelling costs

Faced with outfitting 1,000 workers with new desktops, Donovan Resh did the math and found network computers would help his company avoid spending millions of dollars related to the care and feeding of PCs. Resh, the chief information officer at Retired Persons Services, Inc.

— the pharmacy arm of the American Association of Retired Persons — said cost of PC ownership is more important than purchase price. **Corporate Strategies**, page 69



## New tools at MQSeries expo

Users who plan to use messaging middleware will get a glimpse of new management tools this week at the first MQSeries Technical Conference in San Francisco.

Messaging middleware, such as IBM's MQSeries, lets multiple applications on different platforms share data through the use of secure, asynchronous data messages held in queues.

But there is still a need for configuration and management tools. Leading systems management vendors are addressing that need.

Candle Corp. in Santa Monica, Calif., will announce Version 2.0 of its Command Center MQSeries monitoring software and a new MQSeries configuration tool.

Bools & Babbage, Inc. in San Jose, Calif., will announce availability of AutoOperator for MQSeries, which centrally manages message queues, along with plans to provide a new Windows interface.

— Tim Ouellette

# Gigabit Ethernet gets big backer

By Bob Wallace

**J**3COM CORP. last week became the first big networking vendor to offer near-term Gigabit Ethernet products. But network managers said the emerging 1G bit/sec. networking scheme still has many limitations.

Gigabit Ethernet technology, due for release in the third quarter this year, was designed to let companies add capacity to backbone networks and provide faster access to server farms.

3Com's entry (see chart) is important because the fledgling market was full of small startups, most of which won't ship products for several months.

Although Gigabit Ethernet is far from robust, users said they

can afford to wait for products to mature because their networks aren't heavily loaded.

"We're anxious for Gigabit Ethernet products to hit the street so we can evaluate them. But our backbone network is only about 15% loaded, so we don't plan to replace it with Gigabit Ethernet until early 1999," said Pete Bissonnette, a communications design analyst at Lockheed Martin Corp. in Pittsfield, Mass.

#### WHAT NEEDS TO BE DONE

Users and analysts said the following issues need to be addressed for Gigabit Ethernet to succeed:

- The process of link configuration, in which a Gigabit

#### 3COM READIES GIGABIT FAMILY

Product	Available	Price
SuperStack II Switch 9000 SX (eight-port switch)	Q3	\$19,995
SuperStack II Gigabit Ethernet Module SX (uplink)	Q3	\$2,995
Gigabit EtherLink PCI NIC (adapter card)	Q3	not available
CoreBuilder 7800 Gigabit Ethernet Interface Card	Q4	\$18,000
CoreBuilder 5000 Gigabit Ethernet Module	Q1, 1998	\$5,000

Source: 3Com Corp., Santa Clara, Calif.

Ethernet product "shakes hands" with another device, hasn't been settled. A standard approach is needed, especially between devices made by different vendors.

■ Flow control needs to be finalized. Without it, there isn't a foolproof scheme to assure data won't overflow device buffers and become lost. The same problem caused nightmares for users of early Asynchronous Transfer Mode (ATM) switches.

■ Media support is limited. Gigabit Ethernet is specified only for multi- and single-mode fiber-optic cables. Twisted-pair

cooper support is expected later this year, at the earliest.

"I plan to begin testing Gigabit Ethernet products soon, but lack of support for copper is a big problem," said Ron Simms, a network engineer at Johns Hopkins University in Baltimore. "We have fiber at our server farms, but we have copper in most other places."

■ Gigabit Ethernet uplinks — products that tie LAN switches to Gigabit Ethernet backbones — are few and far between. Without them, users face the expense of replacing switches.

"Vendors were very late to

ship ATM uplinks, and that seriously delayed our ATM installation," said Niraj Patel, chief technology officer at GMAC Commercial Mortgage Corp. in Horsham, Pa. "Uplinks are critical to users who are planning a gradual migration."

On the plus side, users can initially expect to pay \$2,000 to \$4,000 per Gigabit Ethernet port. That means they can get roughly 10 times the bandwidth of 100M bit/sec. Fast Ethernet for twice the cost. □

#### Hospital moves to Gigabit

& to bolster LAN. Page 55

## Groupware, messaging users go without the 'net

► Proprietary links help in mixed environments

By Barb Cole-Gomolski

SOME USERS are rejecting Internet protocols and turning to a new crop of third-party tools to form tighter links between messaging and groupware servers from different vendors.

Those tools could help companies ease migrations, manage mixed environments and share information with partners.

Companies have been sharing electronic mail and directory information for some time via gateways and, more recently, Internet protocols such as Simple Mail Transport Protocol (SMTP) and Lightweight Directory Access Protocol (LDAP).

But the new offerings go beyond linking E-mail and directories to handle the exchange of databases and the contents of public folders, as well as the conversion of groupware applications from one platform to another.

"This is important because you have to be able to talk to any [messaging and groupware] platform today," said Mike Long, operations manager at USA Today in Atlanta.

But that isn't always possible using Internet standards because many groupware platforms are still proprietary at the core, Long said.

#### GROUPWARE DETENTE

The top messaging vendors are promoting interoperability via Internet standards, including:

##### ■ Passing E-mail via SMTP

##### ■ Sharing discussion data via Network News Transport Protocol

##### ■ Accessing directories via LDAP

The Mesa Corp. Inc. in Newton, Mass., this month will ship Mesa Application Exchange, which will convert forms-based applications from Lotus Development Corp.'s Domino to Microsoft Corp.'s Exchange.

Separately, Casali Technological Inc. in Danville, Calif., recently added a version of its Replication data replication tool for Exchange alongside its existing offering for Domino.

And Linkage Software, Inc. in Toronto will enhance its messaging connector for Domino and Exchange to support digital signatures, which are considered key to electronic transactions.

Users said those tools could

ease migrations between products such as Domino and Exchange and make it easier to maintain those systems side by side.

Users also view groupware interoperability tools as key to helping them distribute applications to trading partners that use different groupware environments.

"We are a Notes shop, but we do collaborate with a firm that uses Exchange," said a systems engineer at a large Midwestern manufacturer. "We're not really interested in getting an Exchange server up and running to be able to share project information with them," said the engineer, who didn't want to be named.

The tools could also help companies that have mixed internal messaging environments. "A lot of the work to get these systems to interact is still done manually," said Bill Hanckard, director of systems infrastructure at Tesserae Enterprise Systems, a systems integrator in Wakefield, Mass.

Messaging giants Lotus in Cambridge, Mass.; Microsoft in Redmond, Wash.; and Novell, Inc. in Orem, Utah, have suggested that companies can achieve interoperability through Internet protocols, but some users are skeptical.

"I don't think the [Internet

protocols] are a good enough answer, because of the security issues," said Al Mulinick, a consultant at Glaxo Wellcome, Inc. in Research Triangle Park, N.C. Glaxo is in the midst of a large Exchange deployment.

The groupware interoperability issue isn't likely to go away soon, analysts said. Although many companies strive for a

## 3Com cuts Ethernet prices

By Bob Wallace

3COM CORP. last week slashed prices on its Ethernet and Fast Ethernet switches in a move to help firms more quickly and inexpensively deploy dedicated bandwidth to the desktop.

The Santa Clara, Calif., vendor dropped the price of its Desktop Switch, which provides 24 switched Ethernet ports, from \$124 per port to \$99 per port. The 12-port model now costs \$192 per port, down from \$279 per port.

"This is just the latest round in pricing 'one-downsmanship' from the major switching vendors," said Michael Howard, president of Infonetics Research, Inc. in San Jose, Calif.

"Users can expect these moves to continue and should get excited because these are

unified messaging plan, large sites are likely to pick Domino for groupware applications and Exchange for E-mail.

Then there are companies such as General Motors Corp. in Detroit. The company has 100,000 Notes users, but its Sunstar division uses Exchange.

Similarly, insurance giant Cigna Corp. in Philadelphia is expected to keep about 6,000 Notes seats up and running after its corporate migration to Exchange. □

only list prices, off which most vendors and resellers discount aggressively," Howard said.

In a bid to keep pace in another key Ethernet market, 3Com slashed the price of its eight-port Switch 3000 Fast Ethernet system from \$799 per port to \$599 per port. The 12-port model now costs \$583 per port, down from \$749.

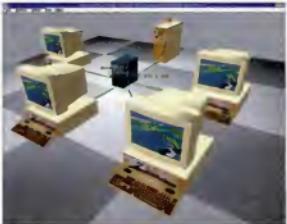
Ethernet switches can provide a dedicated 10M bit/sec. of capacity per user, while shared Ethernet hubs require multiple users to contend for one 10M bit/sec. stream. Fast Ethernet switches provide 10 times that bandwidth.

"We don't see price pressure, because we already have competitive pricing," said a spokesman for rival Cisco Systems, Inc. Bay Networks, Inc. declined comment. □

# Unicenter TNG Is The Smartest Way To Manage Any Network.

*"Unicenter TNG enables us to correlate a wide variety of information from desktops, servers and network devices."*

— Steven Ruegnitz  
VP Lehman Brothers



*The Real World Interface uses virtual reality to create a 3-D environment that represents objects just as they appear in the real world.*

and operating system, Unicenter TNG is open, scalable, extensible and always vendor-neutral.

## The Best Feature Of All: Unicenter TNG Is Shipping Today.

Unicenter is a proven software solution that's available today. It's real, mission-critical and up and running in thousands of sites around the world for some of the smartest users in the world. Users who know that working smarter always beats working harder.

**SHIPPING  
TODAY**

After years of struggling to manage distributed networks, network managers are replacing their hodgepodge of various tools and piecemeal solutions with a single, integrated network management solution.

One that can manage the entire enterprise and all your networks, including TCP/IP, DECnet, IPX/SPX and SNA.

### Only Unicenter TNG Offers End-to-End Management.

Unicenter® TNG™ offers automatic, intelligent, object-oriented network management that enables you to manage proactively. So you

can anticipate and solve problems before they happen.

Unicenter TNG gives you a single point of control for your complex and heterogeneous global network. Its dynamic auto-discovery ensures that your network configuration is current. The Real World Interface™ allows for better visualization of your network. And third-party tools such as element managers integrate with Unicenter TNG through its open and extensible architecture.

### Unicenter TNG Is The Industry Standard For Enterprise Management.

Unicenter TNG is an integrated solution for end-to-end enterprise management. With support for every major hardware platform



Join Us At  
CA-World '97  
July 13-18  
CALL 1-800-CAINFO97

For More Information Call  
1-800-864-2368  
Or Visit [www.ca.com](http://www.ca.com)

**COMPUTER®  
ASSOCIATES**  
Software superior by design.

# Unicenter TNG™

©1997 Computer Associates International, Inc., Isla Vista, CA 93198-7000. All other product names referenced herein are trademarks of their respective companies.

# Military beefing up its hacker defenses

► **Concerned about risks to national security**

By Sharon Machlis

WHY CAN'T the world's most powerful military keep Internet hackers out of its computer systems?

Experts say part of the answer is that no system connected to the Internet is 100% secure, even at the Pentagon. And hackers just love to pester big institutions such as the military.

But the U.S. Department of Defense shares some of the

blame, according to congressional investigators. The U.S. General Accounting Office (GAO) has urged the military to beef up its firewalls, training and security staff, for example.

Recent reports highlight the dangers. The British Broadcasting Corp. last month reported that Dutch hackers who broke in to 34 military computer sites in 1990-91 offered to sell the information to Iraq during the Gulf War. But the Iraqis didn't buy it, probably suspecting a setup. Information about troop movements and weapons from unclassified networks was

## NEWS ANALYSIS

involved.

Also in March, 19-year-old Richard Pryce was fined 1,200 pounds (about \$1,900) by a British court for hacking into the computer system at the Griffiss (N.Y.) Air Force Base. Pryce had also hacked into a network run by Lockheed Martin Corp. in California. The break-ins occurred three years ago.

"I think they have exactly the same incidents and exactly the same problems [in the private sector], but they don't publicize them," said Ron Stillman, chief scientist for computers and telecommunications at the GAO.

The GAO last year investigated break-ins at military computer systems and concluded such attacks "pose serious risks to national security."

Along with beefing up technological defenses with encryption, firewalls and better user authentication, the GAO called for more emphasis on properly training computer security personnel.

## POOR TRAINING

Many military installations lack full-time data security officers, the GAO noted, and a number of systems administrators surveyed said they hadn't received any formal network security training.

The GAO has just launched a program to help the government identify and learn from

top private-industry, enterprise-wide security programs.

Defense contractors also can be targets of hackers in search of military data.

The TRW Space and Electronics Group in Redondo Beach, Calif., is upgrading its firewall. But "no software is absolutely perfect. It needs to be monitored," said Richard Mulligan, manager of computer security at TRW.

Mulligan said his group also is pushing lots of user education. That is a key component of any successful security program, according to experts. Employees are advised to encrypt sensitive information that they send outside the company. For other sensitive information, users are given system-generated passwords. They aren't allowed to pick their own passwords, because those code words may be easy for hackers to figure out.

## EASIER NAVIGATION

Like most security specialists, Mulligan has seen hackers attempt to break in to his network. "Usually it's just people trying to suck up passwords and IDs. It's very difficult to navigate your way around a company's network to find specific information... But in the age of Web browsers, we're making it easier," he said.

Former Department of Defense information security manager Robert Ayers said the private sector can learn from the military's move away from trying to build "intrusion-proof" systems to focus more on detecting and reacting to attacks.

"You just can't build a system, practically speaking, that is going to be unpenetrable," Ayers said. □

## Fend off attacks

Sixty-two percent of the time that auditor Gordon Smith breaks in to a corporate network with an Oracle Corp. database, his team easily gains full control of that database.

The reason: both required to change the default administrative password that ships with Oracle software.

That is just one of many ways that companies inadvertently leave themselves open to easy outside attack, said Smith, president of Canaudit, Inc., a security audit firm in Simi Valley, Calif.

Fortune 500 computer network defenders are usually "either very good or very bad," Smith said. "If we're going to get in, most of the time we get in in the first half-hour."

Despite the publicity surrounding military security, Smith said he believes other parts of the national infrastructure, such as electric power and natural gas companies, are at even greater risk.

"If it was Saddam Hussein, I wouldn't take on the military. I would take on the infrastructure behind it," Smith said. "You wouldn't believe how easy it is to penetrate [some companies]." At one audit, his team found 309 users who hadn't set passwords.

Vendors can also cause security problems for their customers.

"In the past 18 months, we found eight vendor connections which enabled our clients to access competitors' servers [and vice versa] via the software vendor," he said.

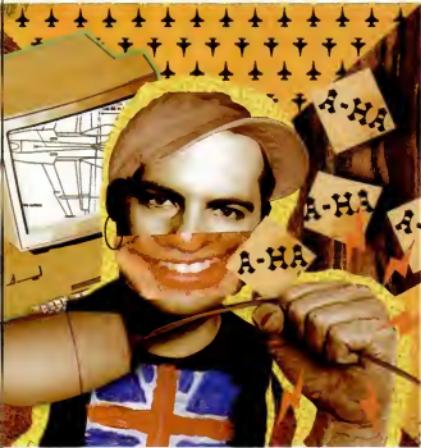
Smith offered the following advice:

- Require all accounts to have passwords at least 12 characters long, with at least one special (nonletter) character, to thwart automated password-cracking software.

- Turn on basic "three strikes and you're out" software features that kick off anyone trying to log on after three incorrect password entries.

- Find out about vendor "back doors" that may allow uncontrolled access to a network.

— Sharon Machlis



## To protect Unix servers, lock the back door

By Sharon Machlis

WORLD WIDE WEB sites are a favorite target for hackers who want to show off their skills, because mischief done there can play such a large public audience.

One way to boost Web site security is to strip down the machine that hosts it, said William J. Orvis, a Computer Incident Advisory Capability team member at University of Califor-

nia Lawrence Livermore National Laboratory in Livermore, Calif.

In the case of a Unix box, Orvis offers the following tips:

- Remove Telnet, file transfer protocol and any other function that lets outsiders tap in to the system for purposes other than reading Web pages.
- Use the cron command to isolate the server files and directories from the system files.
- Make sure the machine the

Web server runs on doesn't have permission to do anything else and is not part of another group within the organization.

- Take away setuid capability of "everything you can," which prevents programs from automatically switching themselves into root. That allows only root users to change passwords.
- Don't allow the Web server to send electronic mail. A batch job can be set up to automatically send E-mail for the server

at another site.

- If pages are being updated remotely, take away Telnet and use something such as ssh (secure shell) that uses encryption. If you must Telnet, use a one-time password scheme.

Similar things should be done with Web servers that run Windows NT or any other operating system, Orvis advised. "Eliminate all the software, and turn off all the services you don't need," he said. □

# Analyze This!

*“Oracle has emerged as the technology leader in online analytical processing (OLAP).”*

Computerworld

OLAP Features	Oracle Express	Arbor	Sybase	Informix	Microsoft
<b>Relational OLAP</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Multi-dimensional OLAP</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Mobile OLAP</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Web Viewing: drill, pivot, rotate</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Web Analysis: forecasting what-if analysis, modeling, etc.</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Object Oriented Tools</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Stored Procedures</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Packaged OLAP Applications</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

On-Line Analytical Processing (OLAP) allows you to get real business benefit out of your data warehouse. Oracle's OLAP servers, database, tools and applications offer the most comprehensive capabilities of any vendor. And with our recent release of Oracle Express Server 6.0™ and Oracle Express Objects,™ all these capabilities can now be deployed on the Web.

For the leader in OLAP solutions, call 1-800-633-1071, ext. 11409, or find us on the Web at <http://www.oracle.com/olap>

**ORACLE®**  
Enabling the Information Age™

# HMO has payment ills

By Thomas Hoffman

**OXFORD HEALTH** Plans, Inc., a \$3 billion managed care company, owes millions of dollars in back payments to New York physicians and hospitals because of problems with the upgrade of its claims processing systems.



Oxford Health Plans is still fixing integration problems

The computer glitches have been a customer-service embarrassment for Oxford, which is considered a technology leader in the health care industry.

The Norwalk, Conn.-based company, which is still fixing integration problems between its Oracle Corp. software and Pyramid Technology Corp. hardware, has started to make amends for its overdue pay-

ments. Oxford's enrollment "has grown so rapidly that they probably have trouble keeping their records up-to-date," said Martin Schaum, a Garden City, N.Y., attorney who represents two New York physician groups that are still owed money by Oxford.

#### MULTISOURCE PROBLEM

Several technical problems contributed to the claims backlog, which occurred when Oxford began converting from its Pick-based claims processing system to an Oracle database last September.

The company converted 80% of its 1.5 million member and vendor accounts "cleanly," but 20% of the files "were more complex and challenging," said David Finkel, Oxford's vice president of operations. "Conversions of this magnitude never go as planned."

Finkel said Oxford also failed to simulate how the systems would perform with 3,000 concurrent users accessing multiple applications.

Taking into account the integration problems between the Oracle and Pyramid environments, the system lost 60% to 70% of its processing capacity, Finkel said.

One result was the average time it took for customer-service representatives to handle calls

swelled from 4 to 8 minutes, Finkel said.

Oxford has taken steps during the past two months to fix the problems. The company has spread some of its enrollment processing to second and third shifts. And instead of running big batch processing jobs sequentially, Oxford runs the applications in parallel.

Oxford has significantly reduced its claims backlog and is processing 89% of its claims within 30 days, Finkel said.

Analysts said claims processing and poor customer service are problems throughout the

New York health care consumers in 1996 ranked Oxford Health Plans first in overall customer satisfaction...

Source: CareData Reports, Inc., New York

#### health care industry.

"The worst-rated area for managed care is not the medical quality issues, but the customer-service issues that the majority of the population is dissatisfied with," said Tod Cooperman, president and CEO at CareData Reports, Inc., a New York-based market research firm.

In a 1996 CareData survey of nearly 3,000 health care con-

sumers in New York, Oxford was ranked first in overall customer satisfaction.

But only 34% of Oxford's New York patients were "highly satisfied" with the company's point-of-service claims processing.

That 34% figure seems low, but it is still better than the 26% satisfaction rate consumers gave other claims processors in the same market. □

# Microsoft denies NT password risk

By Laura Di Dio

**MICROSOFT CORP.** executives last week issued a public denial that there are inherent security gaps in Windows NT that will let hackers easily guess protected passwords and crack the operating system.

Comments posted on some of Microsoft's online forums claimed that by masquerading as a network administrator with Administrator privileges, it is possible to go into the Windows NT Registry Editor database and download the encrypted pass-

word file. Then the hackers have to decode the encrypted passwords and try a dictionary attack to guess the password.

#### TOUGH TO DO

"This type of approach, while theoretically possible, is very far-fetched," said Mike Nash, Microsoft's director of Windows NT marketing. To be successful, a hack of the latest Windows NT password requires that the user has physical access to the server and Administrator privileges. Even so, a successful hacking hinges on whether or not the

business still relies on easy-to-crack, all-text passwords.

The one known security flaw in Windows NT 3.51 security, which allowed hackers to perpetrate a dictionary password attack without physical access to the server, will be closed via a fix in the release of Service Pack 3. The service pack is in beta testing now and is slated to ship this spring.

To help users identify potential security holes, Microsoft has established a security page on its World Wide Web site at [www.microsoft.com/security/](http://www.microsoft.com/security/). □

## SHORTS

### Saudi prince buys Apple stake

A Saudi Arabian prince who has invested heavily in Citicorp and the Disney theme park near Paris last week said he has acquired more than 5% of Apple Computer, Inc.'s shares for \$115 million. Prince Alwaleed Bin Talal Bin Abdulaziz Al Saud said he bought the stock during the past several weeks because he believes "there is serious potential for Apple to provide large returns to its stockholders" as it has done in the past.

### Keyfile upgrades workflow

**KEYFILE CORP.** in Nashua, N.H., is shipping Keyfile 1.1, an upgrade of its workflow system for Microsoft Corp. Exchange that supports the Outlook 97 groupware client. Keyfile also is shipping a new version of its stand-alone Keyfile workflow and document-management system that runs on Windows NT and IBM OS/2 servers.

### Apple ships Power Macs

**Apple Computer, Inc.** last week introduced a line of Power Macintosh computers that feature accelerated graphics and processors that run at 225 to 300 MHz.

The Power Macintosh 6500 series will target the consumer, education and small-business markets. The machines have 32M to 64M bytes of RAM, a 3G- to 4G-byte hard drive, a CD-ROM drive, a 33.6K bit/sec. internal modem and 30 bundled software titles. The new models will cost from \$1,999 to \$2,999.

### Kiwi releases notebook

**KIWI COMPUTER, INC.** in Santa Clara, Calif., recently shipped a 166-MHz Pentium MMX notebook aimed at the midrange market. The notebooks will have 32M bytes of memory, a removable 2.1G-byte hard drive, an 11.3-in. active-matrix screen and space for two Type II PC Cards or one Type III PC Card. The notebook weighs 6 pounds and costs \$3,999.

### Oracle NC software due out

**NETWORK COMPUTER, INC.** in Redwood Shores, Calif., plans to introduce a suite of server-based network computer software that will offer users productivity applications including word processing, electronic mail, spreadsheets and presentation graphics. NC Access software will be generally available in June, with limited quantities available today. Pricing for the client soft-

ware, and the server-based suite, starts at about \$5,000 for a concurrent license, with a minimum of eight users. Network Computer is a spin-off of Oracle Corp.

### NetPC version debuts

**ADVANCED PC TECHNOLOGIES CO.** (APTC) this week plans to unveil its version of the Winnt network computer at WinHEC 97 in San Francisco. APTC's NetPC97 incorporates a CD-ROM drive and a smart-card reader. It includes a Pentium CPU running between 133 and 200 MHz, and 32M or 64M bytes of RAM. APTC is working with VentureCom, Inc., in Cambridge, Mass., to develop a light version of Windows NT for NetPC97 users.

**SHORT TAKES:** The Association for Women in Computing/NYC will hold its annual conference Saturday, April 26 at the Sony Building in New York. For information, call (212) 614-9565 or E-mail [myxtpl@ix.netcom.com](mailto:myxtpl@ix.netcom.com). ... Supply-chain management software maker Manugistics, Inc., in Rockville, Md., reported its annual profit grew 81%, to \$8 million on revenue of \$94.7 million. ... AT&T Corp. and Zurich-based UniSource Carrier Services have agreed to combine Integrated Services Digital Network service offerings to make ISDN easier to use for multinational customers.

# Show attendees to get peek at next Win 95

► Microsoft also will unwrap device drivers, boot upgrades at WinHEC '97

By April Jacobs

ATTENDEES AT Microsoft Corp.'s Windows Hardware Engineering Conference (WinHEC '97) this week will be treated to a first look at Memphis, the new version of Windows 95.

Microsoft also will show off new unified Windows operating systems device drivers and On Now power management enhancements.

"I think they are going to need to talk about what they're doing with the Windows operating systems and how they are going to converge, or if they're going to converge at all," said John Dunkle, president of Workgroup Strategic Services in Portsmouth, N.H.

#### DRIVER'S SEAT

That convergence would at least include Microsoft's plans to offer users a unified interface between Memphis and Windows NT 5.0, a common device driver model and file structures.

Phil Holden, product manager for desktop operating systems at Microsoft, said the company will give users an enhanced Windows Driver Model that will let hardware and software developers write a single driver for Memphis and Windows NT 5.0. Holden said the Memphis software that Microsoft will deliver at the show will lack one core piece planned for the final version: an integrated interface with Microsoft's Internet Explorer 4.0 browser.

#### FOR THE HEC OF IT

- Microsoft will detail the following topics at WinHEC '97 this week:
- Common Windows operating systems device driver model
- On Now power management
- Zero Administration for Windows management tools

Developers have been saying for months that a common driver model would greatly ease their workload, because many companies today are running a mixture of Windows 95 and NT.

Developers currently must write separate drivers for the two operating systems.

Holden said Microsoft also will announce seven new specifications for its On Now power management initiative, which will speed up and simplify the powering up of a machine.

Those specifications will cover audio, communications, display devices, PC cards, peripherals, networking and storage devices.

A desktop that is On Now-enabled would have features similar to those of a television set. A click of a button would turn on all functions without further user

instructions.

The Redmond, Wash., company also will deliver a road map for its Zero Administration for Windows initiative, a set of Windows operating systems-based

tools. The tools will be available in Windows NT 5.0, which ships in mid-1998; as a tool kit supplement for Windows NT 4.0 sometime during the next three months; and as part of Memphis, which

will ship late this year or early next year.

The management tools were designed to lower the cost of managing PCs and serve as the foundation for managing Microsoft and Intel Corp.'s version of the network computer, the NetPC.

Microsoft also plans to outline its Simple Interactive PC Initiative, which will enhance PC-based audio and video capabilities, such as interactive World Wide Web pages and videoconferencing. □



Today's information age began with the invention of the telegraph by Samuel Morse in 1837. And just as the familiar dots & dashes have come to symbolize Morse Code, Innovation Data Processing symbolizes cost-effective, fast, safe and reliable storage management solutions.

Joining forces with EMC Corporation and the Symmetrix® Enterprise Storage Platform (ESP), Innovation paves the way to a disaster recovery solution for open systems and LAN SCSI disk & database volumes to S/390 tape or disk directly across high speed mainframe channels without using network communications.

As you turn to open systems for business critical applications and as database systems continue to grow at incredible proportions, requiring hundreds of gigabytes and sometimes terabytes of disk storage, protecting this information is today's challenge.

With **FDRSOS**, your lifeline to Safeguarding Open Storage, large databases can be protected at ultra high speed and with reliable performance.

A typical user with a 100 GB database using a standard package currently requires 24-48 hours to backup to local DAT tapes. But with **FDRSOS**'s advanced technology, you can backup as much as 50 GBs per hour per tape control unit. And, in the case of disaster, recreate SCSI volumes concurrently without having UNIX machines or PC's operational or communicating.

**High-Speed** • **Reliable** • **Cost-Effective** • **Storage Management Solutions**

**Backup Open Systems to Mainframe:**  
AIX® (RS/6000)®, HP-UX, UNIX®, SUN Solaris™, WindowsNT™, NetWare® and OS/2®



**CORPORATE HEADQUARTERS:** 275 Paterson Avenue, Little Falls, New Jersey 07424 • (201) 890-7300  
Fax: (201) 890-7147 • E-mail: 76322.2076@compuserve.com • http://www.innovationdp.fdr.com

EUROPEAN OFFICES:	FRANCE	GERMANY	NETHERLANDS	UNITED KINGDOM	NORDIC COUNTRIES
	01-47-69-15-15	089-499-0210	039-534-1660	0181-905-1266	+31-36-534-1660

# Netscape tests tool to speed 'net app creation

By Justin Hibbard

NETSCAPE COMMUNICATIONS CORP. this week will release a beta version of its first visual development tool that could simplify the assembly of components into Internet and intranet applications.

Visual JavaScript, formerly code-named Palomar, lets users drag and drop prebuilt components from a palette onto a Hypertext Markup Language (HTML) page. The components include HTML form elements, JavaScript components and Java components written

to the JavaBeans specification.

Other components provide access to services in Netscape's SuiteSpot servers, such as the ability to look up names in the Netscape Directory Server by using the Lightweight Directory Access Protocol. But unlike the Java, JavaScript

and HTML components, the SuiteSpot components run only on SuiteSpot servers.

"Being able to get at all the SuiteSpot services easily instead of having to find them will help," said John Potter, head of the methods, architecture and data team at Deere & Co.'s Waterloo Works unit in Waterloo, Iowa. "We're extremely interested." He said the main benefit of Visual JavaScript will be its ability to develop prototype applications faster than before.

But many users and analysts said it is unclear what level of developer is supposed to use Visual JavaScript.

"On the one hand, you're trying to build a tool that makes [development] easier, but on the other hand, for someone who's not used to using the raw JavaScript code, they're going to find it very confusing," said an IS manager at a large retailer who requested anonymity.

**"Being able to get at all the SuiteSpot services easily . . . will help."**

**- John Potter,**  
Deere & Co.

The problem, he said, is that end users without much programming experience are the primary creators of intranet pages at many companies. Although they often turn to corporate developers for interactive applications, end users are increasingly developing applications themselves, he said.

#### TOO TRICKY

For programming novices, certain features of Visual JavaScript, such as the long, fully qualified names used to identify components, may be too daunting.

But experienced programmers wouldn't have such problems. Stuart Patterson, a senior programmer at Harris Corp. in Palm Bay, Fla., said he could benefit from such a tool, especially if it speeds the delivery of applications.

Patterson said his main concern is that the tool not hide programming complexities and thereby prevent him from gaining easy access to source code. To that end, Visual JavaScript comes with a debugger for manually editing source code and an inspector that lets users customize components visually.

But the tool isn't intended solely for expert programmers or solely for end users, said Mike Gotta, an analyst at Meta Group, Inc. "I think it sits right in the middle," he said. "It's the person who is pulling all the content together."

Netscape officials said the tool was designed for combining components rather than creating them. For creating components, the vendor recommends SuiteTools, its bundled package from third-party vendors such as NetObjects, Inc., Symantec Corp. and NetDynamics, Inc.

A production release of Visual JavaScript will be available in the fourth quarter for \$495. □



We wanted to tell you how our rapid access to large amounts of data maximizes your computing investment (without putting a majestic beast through the indignities of a photoshoot).

solutions? The fact is, MAXSTRAT Gen5 storage servers are scalable to over 800 gigabytes. That's ten times more capacity than other enclosures. Here's the fast part: a data transfer rate of 250 megabytes per second. Which is 15 times faster than competing storage products. > Gen5 is serious centralized storage. > When it comes to today's data-intensive applications, no other solution delivers better throughput and access for leading platforms including Sun, SGI/Cray, Fujitsu, NEC and IBM. Clearly, MAXSTRAT sets the new storage standard. > In some ways, we're like a storage investment protection policy. You see, thanks to MAXSTRAT's compatibility, the Gen5 only gets better if you change or add workstation or supercomputer suppliers. > What makes us the ideal solution? Maybe it's because storage is our ONLY business. We're the specialists. Which brings to mind a few visual possibilities like a...nah, we'll spare you. > To get the most out of your computing investment, call us at 408-383-1600.

Who needs visual cliché when you've

got the world's fastest, most

reliable, high capacity storage

solution? The fact is, MAXSTRAT

Gen5 storage servers are scalable to over 800 gigabytes. That's

ten times more capacity than other enclosures. Here's the fast part: a data transfer rate of 250

megabytes per second. Which is 15 times faster than competing storage products. > Gen5 is

serious centralized storage. > When it comes to today's data-intensive applications, no other

solution delivers better throughput and access for leading platforms including Sun, SGI/Cray,

Fujitsu, NEC and IBM. Clearly, MAXSTRAT sets the new storage standard. > In some ways, we're

like a storage investment protection policy. You see, thanks to MAXSTRAT's compatibility,

the Gen5 only gets better if you change or add workstation or supercomputer suppliers. > What

makes us the ideal solution? Maybe it's because storage is our ONLY business. We're the

specialists. Which brings to mind a few visual possibilities like

a...nah, we'll spare you. > To get the most out of your computing

investment, call us at 408-383-1600.

**MAXSTRAT™**



©1997 MAXSTRAT Corporation.

# *In the beginning there was the pencil.*



People found it handy for jotting things down. But soon their imaginations far outreached the pencil's functionality.

There were stopgap innovations at first. The typewriter. The calculator. The word processor. Then at last, the PC was born—and so too the need for a software platform to release its full potential. Enter Microsoft®

**Windows.** It enabled a whole new generation of **Innovations**—over 100,000 applications used by millions of people every day, sophisticated multimedia programs with live video and audio, powerful communications tools such as e-mail and software for exploring the Internet. The Windows operating system transformed the PC into the **ultimate network computing device**. People were suddenly empowered to do far more, better and faster. With Windows, even mobile users far away from their network could continue working productively as if they were still sitting in their office. But, while all this innovation provides significant benefits, we recognize that there are costs associated with it. Our mission? To continue to enhance the rich functionality of Windows-based computing, while containing and reducing the cost of ownership. It's called the **Zero Administration for Windows Initiative**—a long-term plan that over time will bring you a far better way to deploy and manage your organization's desktops. Today, we're announcing another step toward this goal. The **Zero Administration Kit** is a set of tools to help simplify PC management and bring down cost of ownership by giving you a new level of control over your Windows NT® Workstation-based computers. But this is just another step along the way. With each announcement we make, and every new product we release, you'll see that you really can have the **best of both worlds**—the rich Windows environment your users need, at a cost you can live with. And that's exactly the point.

**Microsoft®**

*Where do you want to go today?*

**Demo the Zero Administration Kit:**  
[www.microsoft.com/windows/innovation/](http://www.microsoft.com/windows/innovation/)

# AS/400 shops talk warehousing

By Tim Ouellette

OFFICIALS FROM THE IBM user group Common this week will line up a user task force to bring their AS/400 data warehousing needs and concerns directly to IBM.

The group will meet with IBM officials, who

have been positioning the AS/400 as a data warehousing vehicle, at this week's Common user group conference in Boston. The group's goal is to provide the vendor with customer feedback on packaging and promotional efforts and on various issues that surround the implementation of data warehouses.

Hammering home the growing interest in data warehousing

## IBM USER GROUP

tools are available, users don't have easy access to them.

"IBM has some work to do with data warehousing tools," said Bob Tipron, director of technology at Whitman-Hart LP, a Chicago consultancy.

"When users think of data warehousing on the AS/400, a lot of them aren't aware that many tools are already [there]," he said.

Van Symons, who leads IBM's data warehousing efforts for the AS/400, said IBM has tackled AS/400 performance issues with the new RISC-based machines but now must make sure users have access to the widest possible range of tools.

IBM will address that issue

## COMMON CONCERN

Top concerns this year among AS/400 shops:

- **IS must be able to develop new applications, which typically drive business decisions, rapidly and reliably**
- **IS must be able to quickly and economically maintain existing applications**
- **IS must be able to support business growth and generate revenue by exploiting emerging technology**

Source: Common Online, Chicago, www.common.org

is Common's World Wide Web site, www.common.org, which offers a list of members' top concerns this year. One concern is making sure users can rapidly create applications and projects such as data warehouses on the AS/400 without being left behind by the market (see chart).

One obstacle has been the slow movement of popular data warehousing tools to the AS/400. And even when such

this week by announcing plans to resell MarginTracker, data warehousing software for the AS/400 targeted at wholesale distributors. The package was developed by Siltron Software, Inc. in Westmont, Ill., with prices starting at \$50,000.

Also, IBM will continue to optimize the DB2/400 database for data warehousing uses.

Observers said the AS/400 can be a strong data warehousing

machine. It offers 64-bit technology — which Unix servers are still trying to support fully — an integrated DB2/400 database and built-in security features. Users have long counted on the machine's reliability and scalability, which will be extended later this year with 12-way RISC processing machines.

"With the new 64-bit RISC boxes and multiprocessing machines coming out, the AS/400 is really turning into a strong data warehousing machine," said Paul McManus, director of application development at Apria Healthcare Group, Inc. in Costa Mesa, Calif.

## JUST ONE

"If you are an AS/400 shop, it would be foolish to use any other box for your data warehouse," said Larry Overstreet, a systems engineer at Dayspring Greeting Cards in Siloam Springs, Ark. "You don't have to play system integrator [with various Unix or Windows NT products], and you can leverage all your existing skill sets and only have one [operating system] to manage."

IBM officials said 600 AS/400 customers tried data warehousing last year, with many large firms such as Nabisco, Inc. and Toys R Us, Inc. being the plunge.

But observers wouldn't call the data warehousing interest a rush, especially with more than 400,000 AS/400s dispersed around the world. That is why the pressure is on for IBM to deliver proof at Common, where 5,000 AS/400 users will be looking for answers.

"AS/400 users say, 'Prove it, and then tell us about it,'" Tipron said. □

IBM in 1995 and is credited with stemming the flow of red ink and stabilizing Digital's flagging PC business.

The latest moves come amid signs of a continuing sales slowdown that has led some observers to predict another lackluster quarter for the company and put increasing pressure on Palmer [CW, March 31].

"There are only so many organizations you can do before people start saying there is nothing going on here," said James Greene, an analyst at Summit Strategies, Inc. in Boston. □

# Palmer reshuffles DEC; consolidates units

By Jaikumar Vijayan

DIGITAL EQUIPMENT CORP. is giving it the old college try. Again.

In yet another effort to find a magic formula for reviving its sputtering turnaround, the Maynard, Mass.-based minicomputer maker last week said it is reorganizing its sales, manufacturing and service groups.

The latest revamp again re-centralizes authority within Digital and reverses CEO Robert Palmer's decision three years ago to create discrete units with

bottom-line authority and responsibility. Now, eight separate units are consolidated under three organizational units.

A spokesman said Digital is also looking at a "whole gamut of possibilities," including possible layoffs, to further reduce the cost of its operations.

The latest move elevates Bruce Claflin to what some observers said is the No. 2 position in the company. Claflin, who heads the PC business unit, will head up the new Worldwide Sales and Marketing unit.

Claflin was imported from

## ON TAP

Geac announcements at this week's user group conference:

### SmartStream client/server division:

- Will integrate Geac's financial systems software into SmartStream package
- Will fund control application for the health care and public sector industries
- Will offer self-service Web-based human resources applications

### EnterpriseServer mainframe division:

- Will add third-party imaging and workflow to Expert and Millennium lines
- Will add third-party electronic commerce to purchasing models
- Will add graphical user interface with Web and Java capabilities
- Will integrate Unix data warehousing tools

# Geac to focus on financial, human resources apps

By Randy Weston

IN ITS FIRST user group conference since buying Dun & Bradstreet Software last year, Geac Computer Corp. this week will lay out its plans to focus on core financial and human resources applications and key vertical markets.

"The main message is that we now have our arms around what our business plan is, and we are making substantial investments in the products to deliver on it," said Steve Ely, Geac's vice president of marketing for the client/server division.

Markham, Ontario-based Geac bought D&B Software late last year for \$150 million. Geac has reorganized into separate client/server and mainframe divisions, consolidated various Geac holdings and dropped a manufacturing module to concentrate on financial and human resource markets.

Ely said the new business plan calls for Geac to focus on key vertical markets of financial services, health care, business services and the public sector. Geac also wants to become the leading financial application vendor for Microsoft Corp.'s BackOffice, tweak products so they are database-independent and develop self-service World Wide Web-enabled applications.

But some users will be looking for something that resembles the old D&B Software.

"I want to see continuity. I want them to ensure that the things we saw with Dun & Bradstreet are going to continue," said Mary Delaschmit, vice pres-

ident of human resource information systems at Equifax, Inc. in Atlanta.

Delaschmit said her company wants Geac to maintain the business plan laid out by D&B Software and add functionality to the SmartStream and EnterpriseServer product lines while improving functionality.

Equifax, an international business information company best known for its credit-reporting division, uses Geac's SmartStream client/server human resource application package and its EnterpriseServer mainframe financial application.

The firm was also a beta site for Geac's CyberStream self-service human resources applications, which are now commercially available. Delaschmit said that relationship gave her early insight into Geac's vision.

### CONTINUITY IS KEY

"Working with them on a day-to-day basis, they didn't seem to miss a beat," she said. "A lot of good people are still there and doing a good job. We are looking for as much of that continuity as we can get."

Users such as Delaschmit have been waiting for the past few months for the dust to settle at the former D&B Software's Atlanta headquarters. The former Dun & Bradstreet Corp. unit spent nearly a year on the block, and one purchase deal fell through at the last minute last summer. Geac finally stepped in with an offer late last year. □

Senior writer Tim Ouellette contributed to this story.



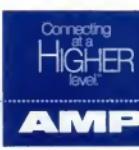
# "Wait honey, I'm almost done with the connector."

Connector? It looks like a computer. Well, not to someone from AMP, because, as the world's premier connector company, our people have been stretching the concept of connectors. Usually thought of as pieces of plastic and metal sitting between cables and circuit boards, connectors are being redefined. We're broadening their definition to include entire signal paths. For example, we see the one between a keyboard and the computer screen as one long connector. This broader definition is the basis for our future direction. By building on our traditional strengths, we've added technologies that fit into our vision – technologies like sensors, switches, optoelectronics, circuit boards, and wireless components. And today, we're bringing these technologies together to create proven connectivity systems that our customers can incorporate into their designs, helping them reduce costs and speed their product development. So while not everyone would think of a computer as a connector, our customers benefit because our people do.

AMP Incorporated, Harrisburg, PA 17105-3608 Contact your regional center: USA 1-800-522-6752 Canada 905-470-4425  
United Kingdom 44-1753-676800 Singapore 65-482-0311 Japan 81-44-813-8502

[www.amp.com](http://www.amp.com)

AMP and Connecting at a Higher level are trademarks.



# Informix embraces open road

By Craig Stedman

FACING UP TO the fact that it can't force proprietary development tools on database users anymore, Informix Software, Inc. is throwing in the towel and going mainstream.

The Menlo Park, Calif., company last week announced a strategy overhaul aimed at reviving its sinking tools business. The new Universal Tools approach shifts Informix's focus from its own NewEra software to better-known products such as Microsoft Corp.'s Visual Basic, Powersoft's PowerBuilder and third-party Java tools.

NewEra will continue to be updated with new features, including support for the company's object-enabled Universal Server database. But Informix also introduced software that automatically generates SQL code and database links for users who write applications with other development tools. And it detailed plans to resell Symantec Corp.'s Java-based Visual Cafe Pro tool (see chart).

Several Informix users who passed on NewEra said the more open approach could make it easier to create applications with their favorite tools. Until now, developers with general-purpose tools have had to write the code needed to tap in to Informix's databases.

Gary Thomson, vice president

UNIVERSAL OPENNESS		
Product	Features	Price/Availability
Data Director	Drag-and-drop tool for creating database models and code	\$50 to \$200 per user; Q2 for Java and other Visual Basic tools
NewEra 3.1	Supports Web clients and Universal Server database	\$4,495 per developer, plus \$200 per user; available in Q3
Visual Cafe Pro	Symantec's Java developer tool will be bundled with Data Director	Not announced

of information systems technology at Choice Hotels International, Inc. in Phoenix, said his developers "needed to understand a handle of interfaces" before they could write Informix-based applications with Microsoft Visual C++ and PowerBuilder.

Choice Hotels, which operates 3,400 hotels worldwide, tested NewEra several years ago. "But it didn't come out high in our marks," Thomson said. "Our testers were pre-Informix people, and they said it was cumbersome to use. Nobody said they had to have it."

And finding developers who are familiar with NewEra isn't easy, said Jack Look, a data de-

signer and architect at the American Medical Association in Chicago. "NewEra may be a great tool, but you'd have to go train everyone because no one knows how to use it," he said.

Informix's tool sales slumped 12% last year, and the decline is thought to have contributed to an expected first-quarter loss.

"The market has changed dramatically from three or four years ago, and developers want to use open tools now," said Brett Bachman, general manager of enterprise products at Informix.

**& Informix predicts a disastrous first quarter.**

Page 32

# Cabletron gulps Java

► Future Spectrum tools to focus on Web access

By Patrick Dryden

CABLETRON SYSTEMS, INC. last week outlined steps to improve access its Spectrum network management tools via the World Wide Web.

The early supporter of the trend toward browser access to once-limited status and troubleshooting information will add three Web-based tools this year.

Next year, Cabletron will support the Common Object Request Broker Architecture (CORBA) and reusable services written in Java to speed delivery of new management applications for Spectrum users.

The sooner the better, said Jim Gogan, director of networks and communication at the University of North Carolina in Chapel Hill. "We've been pushing Cabletron for more help, because their Web support only goes so far," Gogan said. "The issue is timely response: More staff need the power to reach these tools from the browser instead of just on their PC so we can find and fix problems on 20,000 nodes in 140 buildings."

Spectrum lets users view reports and alarms from a browser instead of just from a Unix or Windows NT console. Cabletron, in Rochester, N.H., promises more interaction with Spectrum tools and information.

The company expects to ship by fall a Web-based version of SpectroRx, a tool that applies artificial intelligence to historical situations. Any browser with permission can reach the tool to diagnose and fix a problem.

A lot of problems recur, so we want broad access to a troubleshooting tool that builds on the past, because our support staff is always turning over," Gogan said.

## JAVA JUNCTION

A new Java-based tool will manage Asynchronous Transfer Mode switches. It begins beta testing this month.

Another Java application arriving late this year will manage Cabletron's SmartSwitch models independently or through Spectrum. It will serve as the model for Java-based tools due next year as Cabletron strives to add more flexibility for management software developers.

By enhancing Spectrum's interface with CORBA support and easy-to-use objects, Cabletron hopes to gain broader integration with other vendors' management tools.

And Cabletron can follow the lead of vendors such as Cisco Systems, Inc., which has been building Web-server capability into its gear and testing Java management applets. □

# BMC Software to expand Patrol scope

► Integration with key scheduling, security tools yields alternative suite

By Patrick Dryden

HOUSTON-BASED BMC Software, Inc. this week will announce two alliances that extend the reach of its popular Patrol system manager by integrating it with two more key management applications.

In addition to monitoring servers and databases, Patrol users will be able to control security and organize tasks throughout distributed networks by adding tools from leaders in these management specialties.

These include the OmniGuard set of security management tools from Axent Technologies, Inc. in Rockville, Md.,



Those who use BMC Software's Patrol system manager can define rules to manage systems and applications

and the Maestro job scheduler from Unison Software, Inc. in Santa Clara, Calif.

Together, the vendors save users the effort of making these tools work with one another. The result is a basic integrated-management suite that can help managers quickly find and fix problems through the Patrol console.

"We thought Patrol and Maestro served different functions of troubleshooting and scheduling, so we never thought of linking them," said Dan Hughes, a systems engineer at T. Rowe Price Investment Services, Inc., an investment

firm in Baltimore. "This is a pleasant surprise."

When a database job fails, operators tracking tasks through Maestro learn only that it ended, Hughes said. By linking event information from Patrol, they can learn, for example, that an overloaded processor caused the failure, he said.

"Now we can use our skills better to solve problems," Hughes said. Having both tools integrated will be especially helpful at night, when the skeleton crew has only one monitor to watch, he said.

## GOOD OPTION

Analysts said BMC offers a best-of-breed alternative to the major integrated platforms. Those include Unicenter from Computer Associates International, Inc.; OpenView from Hewlett-Packard Co.; and the Tivoli Management Environment (TME) from IBM's Tivoli Systems, Inc.

Although "not on a par with

the big suites," BMC's integration with Axent and Unison lets managers "solve a particular set of problems without going to a heavy-duty framework," said Paul Mason, director of the enterprise systems management program at International Data Corp. in Framingham, Mass.

BMC and its two latest partners don't offer the rich integration between functions found in the established suites, and each tool must be sold and supported separately, said Donna Scott, a research director at Gartner Group, Inc. in Stamford, Conn.

Axent expects to complete Patrol support for two of its OmniGuard products in June. The Intruder Alert and Enterprise Security Manager modules will each cost \$5,000. They run on one or more OmniGuard servers in an enterprise.

Unison expects to ship a Matro module for Patrol next month. That software, which costs \$1,200 per system, must be loaded on every server. □

# PowerBuilder 5.0

Named "Product of the Year"  
by Datamation and InfoWorld.



 Application development technology is constantly changing. And keeping up is no easy task. That's where PowerBuilder comes in. It's your enterprise development tool that's always one step ahead. Which is why *Datamation* and *InfoWorld* both gave PowerBuilder 5.0 "Product of the Year" awards. In fact, *InfoWorld* hailed PowerBuilder 5.0 as "an outstanding platform for enterprise applications." Our users demanded the best in application development for the enterprise. And that's what we gave them. Discover what PowerBuilder 5.0 can do for your business. Visit [www.powersoft.com](http://www.powersoft.com) or call 1-800-395-3525.

## BIG BROTHER

Software that monitors end users' Internet usage

Product	Company	Price
Net Access Manager	Sequel Technology Bellevue, Wash. www.sequeltech.com	\$3,499 (100 users) \$12,499 (500 users)
Purview Internet Manager	On Technology Cambridge, Mass. www.on.com	\$10,500 (500 users) \$14,000 (1,000 users)
SessionWall-3	AbiNet Grapevine, Texas www.abinet.com	\$4,950 (200 users) (\$3,495 by May 15) \$14,950 (unlimited) (\$9,950 by May 15)
WinWhatWhere (monitors general usage, not Internet-specific)	WinWhatWhere Kennewick, Wash. www.winwhatwhere.com	\$495 (10 users)

## Wireless 'net access services emerging

CONTINUED FROM COVER 1

Los Angeles, San Diego and Portland, Ore., by year's end. It will send data at speeds between 28.8K and 256K bit/sec. It will receive data at speeds between 256K and 10M bit/sec.

Metrocom, Inc. in Los Gatos, Calif., plans to expand its wireless Internet service from three cities to 16. And World Wireless Communications, Inc. in Salt Lake City is beta-testing its wireless Internet connection through Utah Internet Services, also in Salt Lake City.

## NEED FOR SPEED

Wireless Internet access products will attract users looking for high-speed access at relatively low cost, said William Frezza, an analyst at Wireless Computing Associates, Inc. in Yardley, Pa.

"When priced against T1 lines, these products will look pretty attractive," he said. For instance, World Wireless expects to charge between \$600 and \$1,000 per month for 1M bit/sec. service and \$2,500 to \$5,000 per month for transmission speeds of 4M bit/sec. By comparison, a T1 line that moves data at 1.5M bit/sec. costs about \$2,000 per month.

Proponents also argue that the wireless services will offer significant advantages over hard-wired connections. Low-end services, such as the Ricochet wireless modem connection from Metrocom, tout mobility as a plus.

"In a hot-shot corporate environment, you can walk around the whole building with a laptop in your hand and a wireless connection on your belt," said David Hughes, a managing partner at Old Colorado City Communications Co. in Colorado.

The company is conducting wireless Internet access trials for schools on behalf of the National Science Foundation.

For high-end services, users won't need to tear apart walls and dig up the pavement to in-

## No wire act

Wireless Internet access uses radio transmitters and receivers to exchange TCP/IP signals, replacing hard-wired connections.

Wireless modems are used on notebook computers and handheld devices, moving data up to 28.8K bit/sec. Recent services were designed for larger systems at faster throughput — 1M bit/sec. and faster.

Technologies to enable these systems include cellular modems, short-range radio broadcasts and a transmission technique called "spread spectrum." One of the pioneering patents for spread spectrum was filed by movie star Hedy Lamarr.

The benefits include the following:

Lower costs: High-speed systems are touted as being a fraction of the cost of T1 lines, moving data at similar rates or faster.

Mobility: For wireless modems, and limited mobility for high-speed systems as well.

Ease and flexibility of installation: No need to knock out walls or dig up ground to lay wire.

— Mitch Wagner

## Monitoring tools track surfing

CONTINUED FROM COVER 1

tions, shopping for cars or checking the latest sports scores on company time, proponents said. Systems administrators can also use the data to stop the use of valuable network resources for nonbusiness-related activities.

"We have a written policy — what's acceptable and what isn't," said Debbie Curtin, an information security specialist at

Madison Gas & Electric Co. in Madison, Wis. Like many companies that use these tools, the utility monitors network activity to ensure corporate policies are followed.

But critics argue that detailed monitoring shows a lack of trust and respect in the workplace and can cause a backlash among users.

## POLICY-MAKERS

As World Wide Web use continues to explode, the popularity of corporate monitoring tools is likely to rise as well, said Chris Stevens, a research analyst at Aberdeen Group, Inc. in Boston. "There will be a growing need to implement Internet policies," he said.

Now that many information systems departments have acceded to user and management demands for widespread Internet connections, companies are discovering that "the amount of time that's spent on these things is extreme. It's really easy to waste time," Stevens said.

A typical telephone conversation averages around six minutes, but an Internet connection generally lasts 20 to 30 minutes. "The need to manage information resources and employees effectively requires intelligence," Stevens said.

Some 15 executives said they don't target individuals but seek to understand overall network patterns.

At Black & Decker Corp. in Tonawanda, N.Y., for example, monitoring showed that only 23% of the traffic going across the company's Internet connection was

business-related. "That was kind of a shocker," said IS manager Stephen Swan. Management sent out general notices urging people to use the Internet for business purposes. "Employee productivity is probably the major issue" in monitoring traffic, he said.

Chris Wiley, a network administrator at a banking technology company, discovered that a company-approved after-hours Doomer user group was sapping so much bandwidth that it was slowing down important evening network tasks. The company advised Doomer players not to access the network until after 9 p.m. Without the analysis from the SessionWall-3 program from AbiNet, Inc. in Grapevine, Texas, Wiley said, he wouldn't have pinpointed the cause of the bottleneck.

## GROUNDS FOR DISMISSAL

At some companies, managers who suspect an employee is wasting too much time on the Internet are seeking confirmation from Web monitoring logs. Bell Mobility Cellular in Toronto, which uses Purview Internet Manager from On Technology Corp. in Cambridge, Mass., fired one worker after issuing several warnings about spending too much time on the Internet, said LAN specialist Peter Williams.

Officials at Madison Gas & Electric check specific users only if a manager makes a request, Curtin said. IS sends results back to that manager, who discusses them with the employee. "Then it stops," she said. □

## IS, leave our Web alone

Not surprisingly, some privacy advocates oppose monitoring employee Web usage.

"A good workplace, where there's trust of employees, shouldn't require that type of monitoring," said Marc Rotenberg, director of the Electronic Privacy Information Center in Washington.

But Lauren Weinstein, monitor of an Internet privacy forum (www.vortex.com/privacy), said companies can face lawsuits if employees download or send pornography and therefore must protect themselves.

Managers should develop a specific corporate policy on acceptable use of the Internet and publicize it, Weinstein advised, and they should be flexible about occasional recreational surfing.

"You need a large dose of common sense and a great big dose of information," he said. "The key question is: Are employees informed?"

— Sharon Machlis



Hedy Lamarr

Filed wireless patent

stall wiring to connect systems. Chris Pizay, a webmaster at Universal Press Syndicate in Kansas City, Mo., said he is reluctant to try wireless Internet access.

"A lot of the people I've talked to that have tried these cellular modems haven't been particularly happy with them. They say they've been disconnected a lot," he said. "I have enough problems with Internet access right now with running our Web sites. The thought of being connected via wireless isn't all that interesting to me."

Most early deployments so far have been in schools, isolated rural areas and developing countries. But business access is expected to roll out this year. □

# AOL cagey about online acquisition

► **H&R Block puts CompuServe on the block**

By Stewart Deck

**AMERICA ONLINE, INC.** last week danced around questions regarding its design on CompuServe Corp., after the parent of its rival confirmed that it had put the struggling online provider on the block.

An AOL spokesman said the popular Dulles, Va.-based online service "does not comment on market rumors," even in this case, when a portion of the rumor has been confirmed by CompuServe parent H&R Block, Inc.

Linda McDougall, an H&R Block spokeswoman, said she couldn't say if H&R was talking with only one company. CompuServe wasn't available for comment and didn't return phone calls.

But AOL tops the list of likely buyers assembled by industry observers. Other candidates include Microsoft Corp., one of the regional Bell operating companies (RBOC), GTE Corp. and Time Warner, Inc.

Ulrich Weil, an analyst at Friedman, Billings, Ramsey & Co., an Arlington, Va.-based investment firm, said some suitors may be interested in acquiring pieces of CompuServe but not the entire company.

## AT A GLANCE

**CompuServe Corp.**  
Columbus, Ohio

**3,650 employees**

**2.9 million subscribers worldwide**

In the past 12 months, the company posted \$102.9 million in losses on revenue of \$848.2 million

For example, he said Microsoft might find CompuServe's subscribers an attractive purchase but wouldn't be interested in the CompuServe network technology because The Microsoft Network rides on UUNet Technologies, Inc.'s backbone.

AOL stands out as a candidate for several reasons. The company has been looking at several ways to expand its network, said Rebecca Wetzel, director of Internet consulting at TeleChoice, Inc., a Verona, N.J.-based consultancy. The addition of CompuServe's network would give AOL's frustrated users more capacity.

"This also gives AOL a way to migrate subscribers away from its \$19.95 service to higher-value service offerings," said Barbara Ells, an analyst at Zona Research, Inc., a consultancy in Redwood City, Calif.

CompuServe's recent network infrastructure upgrades also are attractive, Ells said.

CompuServe's subscriber base is another attraction, said Michael Murphy, editor of "The California Technology Stock Letter," a newsletter in Half Moon

Bay, Calif. Murphy said AOL's customer acquisition expenses — as much as \$300 per subscriber — are making it difficult for AOL to turn a profit "no matter what they buy or what they do."

Murphy said the supposed negotiations between the two online services remind him of another historic partnership. "It reminds me of the two big steam engine companies joining forces in 1918 to combat the gas-powered engine manufacturers," he said. □

Several analysts said CompuServe and its 2.9 million worldwide subscribers also might prove tempting for an RBOC since these phone companies will need to offer more services than just long-distance to attract and keep customers. The more services — including CompuServe's Internet access — that an RBOC could provide, the harder it would be for a customer to cancel its entire service relationship. □

“Hi, I’m Bob and I want to give your company a free network computer.”



Why would I give you a free NC?

I want to prove to you how good our NCs will fit into your network. Not some "theoretical" company running "a general type of software." Your network. Your applications.

As the recognized leader in thin client network access devices, we've installed more than 340,000 worldwide.

Of course quantities of free NCs are limited - it's an incredible offer, but we're not crazy.

Visit [www.ncd.com/freenc.html](http://www.ncd.com/freenc.html) to see if you qualify for a free NC and to find out how you can save up to 41% in support and capital costs.

Take my word for it. Would a guy named Bob steer you wrong?

Bob Gilbertson,  
President & CEO  
NCD

NCD

Network Computing Devices

The Network Computer Company™

A limited quantity of up to 300 NCs will be made available as part of a promotional offer.  
Limited to U.S. and Canada only.

Settings based on a 1997 Gartner Group study of  
NCs versus PCs in a networked environment.

© 1997 NCD is a trademark of Network Computer Devices, Inc.  
All other trademarks are the property of their respective holders.





# When you combine two #1 products, the opportunity is insurmountable.

It's a match made in ServerHeaven.

NCR's WorldMark™, the world's most scalable, mission-critical servers, and CA's Unicenter® TNG™, the industry's most powerful network and systems management software.

Together, they offer customers a superior enterprise management solution that reaches all the way from a single server up to the massively parallel WorldMark 5100M with 4,096 processors. Not only will this dynamic duo manage NCR data warehousing and high-availability transaction processing environments, but it will also manage millions of NCR point-of-sale devices and automated teller machines.

To make the most of this opportunity, simply call us.

We'll send you complete information on everything that this important new alliance will mean for you.

For more information call 1-800-CALL-NCR, ext. 3001. Or visit us at: [www.ncr.com/product](http://www.ncr.com/product) or [www.cai.com](http://www.cai.com)



# Bay Networks boosts Rmon 2 support

► New stand-alone monitor keeps tabs on network

By Patrick Dryden

Bay Networks, Inc. last week announced broader support for the recently standardized Remote Monitoring

(Rmon) a specification with two open tools that analyze network performance.

Bay's entitlements include PocketProbe, a small stand-alone monitor that costs roughly half as much as competing

products. Bay also announced upgraded Optivity Analysis software, which interprets data gathered by any standard-compliant probe or agent embedded within internetworking gear.

Some Bay users welcomed the standard tools, which are due out by next

month. But others said proprietary products will suffice for now.

"My clients prefer a standard monitoring approach to individual vendors' probes and agents running on PCs," said Andrew Jazwinski, president of Network Performance Corp., a consultancy in Dunkirk, Md.

But because the Internet Engineering Task Force didn't approve Rmon 2 until last month — a move that unleashed the shipment of compliant products — "users had turned to proprietary tools for tuning performance and tracking usage for chargeback," Jazwinski said.

**Because of PocketProbe's small size, "Now I won't get a hernia hauling so much equipment out to test a client's network."**

- Andrew Jazwinski  
Network Performance

# PERFORMANCE is EVERYTHING

*for data warehouse success*

**RED BRICK® WAREHOUSE 5.0 IS THE WORLD'S fastest and most scalable relational database** for data warehousing, including data marts, OLAP and data mining.

Performance is Everything in data

warehousing. The "Universal, generic,

one-size-fits-all

RDBMS"

approach is

wrong for data

warehousing.

Red Brick Warehouse is the only RDBMS

designed specifically for data warehousing.

With Red Brick, you get a data warehouse

solution that performs ten times faster for half

the cost, deployed in one-third the time.

Red Brick is the industry's fastest growing

database company and the leading provider

of high-perfor-

mance RDBMS

products for data

warehousing. Our

customers are successful because our prod-

ucts and service enable more users to analyze

more data and make better decisions faster.

To learn more, attend the "Performance is

Everything" seminar in your area. Register

now: 1 800 939 1845 or [www.redbrick.com](http://www.redbrick.com).

Register now for the  
"Performance is Everything"  
seminar in your area.

1 800 939 1845  
[www.redbrick.com](http://www.redbrick.com)



**RED BRICK®**  
The Data Warehouse Company™

Red Brick Systems, Inc. 485 Alberto Way, Los Gatos, CA 95032 USA [www.redbrick.com](http://www.redbrick.com)  
© 1997 Red Brick Systems, Inc. All rights reserved. All trademarks and registered trademarks are property of their respective holders.

The second-generation Rmon standard defines ways to track network and application activity between clients and servers. The original Rmon standard watched packets flow only through a single segment, but vendors added their own extensions to reveal higher-level information.

"We could upgrade the agents in our Bay hubs to gather Rmon 2 data, but we don't need a lot of this information," said Debby Briggs, a wide-area network consultant at Healthsource, Inc. in Hooksett, N.H.

Bandwidth utilization is stable, Briggs said. And Healthsource already has adequate tools, she said, including Escope from Compuware Corp. in Farmington Hills, Mich., and Network Health from Concord Communications, Inc. in Marlboro, Mass.

The \$1,495 price of the upcoming PocketProbe spells relief for Bay user Tim Carlin, an infrastructure technologist at Toys R Us, Inc. in Parsippany, N.J.

The price is low enough to deploy probes throughout Toys R Us stores for more accurate monitoring and troubleshooting of network traffic problems, Carlin said.

Previously, Bay's Rmon probes cost \$2,800. Customers who buy in volume should get the combination Rmon and Rmon 2 probe for \$1,000 each, Jazwinski said. Stand-alone Rmon probes have been "too damn expensive," he said, which has kept large organizations from fully deploying the instruments in their networks.

Bay also offers Rmon 2 upgrades for management modules that are embedded in its internetworking gear.

Other vendors preparing Rmon 2 support for their products include 3Com Corp. in Santa Clara, Calif.; Hewlett-Packard Co. in Palo Alto, Calif.; and Network Systems, Inc. (formerly Frontier Software Development, Inc.) in Chelmsford, Mass. □

# Network software that's well-designed, well-implemented and well-reviewed.

**"Best enterprise management  
software of 1996."**

*– Infoworld praises Solstice™ Enterprise Manager™ software\**

**"Solaris is a highly scalable, powerful and flexible  
OS well suited to general Internet  
service and enterprise-wide intranet services."**

*– Network Computing raves about Sun™ Solaris™ operating environment†*

**"Many new Java™ development tools were released  
this year, but none as radical as Sun's Java™ Workshop.™"**

*– PC Magazine honors Java WorkShop Software\**

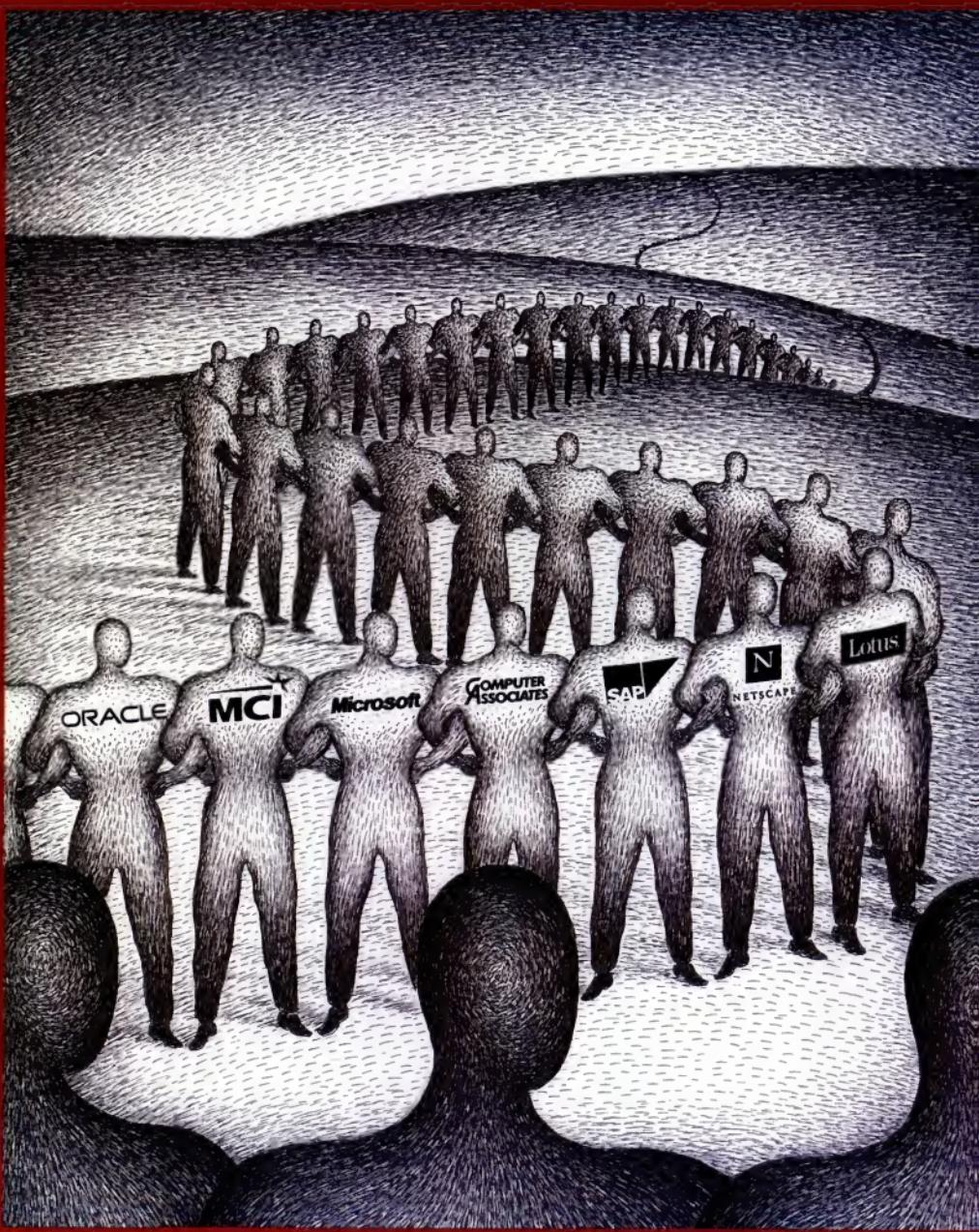
And there's a whole lot more where that came from.  
To see for yourself, visit our website or give us a call.

Develop, deploy and manage with Sun™ Workshop,™ Solaris, and Solstice™ Software.

[www.sun.com/sunsoft/reviews/](http://www.sun.com/sunsoft/reviews/) or contact 1-800-SUNSOFT (786-7638)



THE NETWORK IS THE COMPUTER.™



In business, the lone wolf is a vanishing species. No single company has all the answers.

Which is why **DIGITAL** offers you not merely the world's fastest 64-bit servers.

But one of the most formidable arrays of allies and partners in all of computerdom. **DIGITAL** and Microsoft\* have allied to bring Windows NT\* and BackOffice™ solutions to your entire enterprise. **DIGITAL** and Oracle\* offer record-shattering performance, transforming databases and busi-



ness applications into potent

**Not only are** **DIGITAL AlphaServer systems powerful.**

competitive weaponry. Computer Associates™ teams with **DIGITAL** to deliver unparalleled expertise in mission-critical **They also have** enterprise management solutions.

**powerful friends.**

Together, SAP™ and **DIGITAL** offer business application solutions, for a better return on your information. Then again, your solution might be a fully integrated computer/telecommunications system from MCI\* and **DIGITAL**. Or Internet and intranet technology from Netscape™ Communications and **DIGITAL**. Or Web-enabled enterprise applications from Lotus\* and **DIGITAL**. In fact, **DIGITAL** has thousands of partnerships, with one singular result. AlphaServer™ systems promise not just raw performance. But a practical, powerful business edge. Call 1-800-DIGITAL, ext. 266. See us at [www.ads.digital.com/friends](http://www.ads.digital.com/friends). Begin to make our partners—and the **DIGITAL** edge—your own.

**digital**™  
Whatever it takes.™

# Bay slashes price on 10M/100M switch

By Bob Wallace

**BAY NETWORKS, INC.** last week smashed the \$500 per port price barrier for 10M/100M bit/sec. switches by releasing a system that weighs in at \$249 per port.

Bay's BayStack 350 Autosense Switch lets information systems managers scale bandwidth from 10M to 100M bit/sec. on each port without having to buy a replacement switch. And the rock-bottom price eliminates sticker shock.

Desktop computers need a 10M/100M

bit/sec. adapter card to use the switch. These cards are available from a number of sources, including 3Com Corp. and Intel Corp., both in Santa Clara, Calif., for \$100 to \$200 when bought in quantity.

Although analysts stressed that changes to existing desktop computers are un-

popular with users, most major vendors equip all new PCs and workstations with the 10M/100M bit/sec. cards.

Santa Clara-based Bay has been shipping a 10M/100M bit/sec. switch, called the 28115, for several years. The switch originally listed at roughly \$1,000 per port, but Bay later reduced the price to the \$600 to \$700 per port range.

But to the surprise of one analyst, Bay doesn't plan to offer incentives for 28115 users to move to the cheaper BayStack 350. That is significant because massive industry consolidation is intensifying competition.

"Bay needs to do a good job of tying down its client base," said Jim Metzler, vice president of consulting services at Strategic Network Consulting, Inc. "Bay's mind share in the user community is not ascending. They need to keep 28115 users from becoming free agents."

Metzler said he thinks Bay could do that by inducing 28115 users to buy the more advanced and less expensive BayStack 350 once the older switches have been depreciated. Otherwise, he warned, those users are likely to move to similar switches from rivals, especially if prices are cut on those systems.

## TURN UP THE HEAT

Pricing competition for 10M/100M Ethernet switches intensifies

Vendor	Price per port
Cisco	\$1,071
Intel	\$624
Cabletron	\$500
Bay Networks	\$249

Bay doesn't seem concerned. "At this point in time, no trade-in type programs are planned," said Hossein Alaei, a Bay senior product manager. "If the 28115 was going away, then we'd consider it."

Although Bay has the lead of the top-tier network companies in 10M/100M bit/sec. switch pricing, that may not last.

"I don't think Bay will be the price leader for long," Metzler said. "I wouldn't be surprised if Intel and others took them on. Pricing competition will be brutal, but great for users."

An Intel spokesman said the company plans to reduce the \$624 per port cost of its recently announced 10M/100M bit/sec. switch but wouldn't say by how much or when.

Bay couldn't have hit the \$249 price point this quickly if it hadn't acquired NetCIs, Inc., an Acton, Mass., start-up, for roughly \$100 million late last year, analysts said. NetCIs made application-specific integrated circuits (ASIC), which function as the brains of switches. It was faster for Bay to buy the technology than to develop it internally.

In fact, development problems with ASICs are what kept the 28115 pricey.

The BayStack 350 has a 1.2G bit/sec. backplane and is shipping now with 16 ports for \$3,995. A second model with 12 ports and two Fast Ethernet uplinks will ship in June for \$4,995. □

how do i roll  
something out to 5,000 users  
at 30 sites running 3 different  
operating systems?

Can we give everyone  
access to our databases without  
breaking security? Or  
breaking the bank??

how can  
i provide report and analysis capabilities without  
re-training the whole  
damn staff?

you gotta know

Introducing Seagate  
Crystal Info, the  
innovative tool for  
accessing, analyzing,  
and distributing  
information. It fea-  
tures unique APS  
Clustering, for in-  
creased scalability  
and performance.  
And its capabilities  
can even be accessed  
through a Web  
browser. For a free  
Pilot Pak, call today.  
Because in your  
world, uncertainty  
is not an option.  
You gotta assess.  
You gotta decide.  
You gotta know.

Seagate Crystal INFO

Seagate Software  
1-800-877-2340•A5  
www.ing.seagate.com

© 1996-1997 Seagate Software, Inc. Seagate Crystal Info, Seagate Software and the Seagate logo are trademarks of Seagate Technology, Inc. or one of its subsidiaries. All other trademarks are the property of their respective owners. Outside the US & Canada, call 1-800-661-5435. "You gotta know" is used by Seagate Software under license.

With constant IT equipment upgrades,  
your old stuff...



ends up someone else's problem.

Isn't it strange how vendors tell you what a great investment their bleeding edge technology is this year, then come back the next year with their even more expensive latest and greatest.

There is, however, a less costly way to ensure your networks are always the best configuration of hardware, NOS and applications. Leasing and upgrade programs from MCI. That's right, MCI. Because, since we acquired SHL Systemhouse™ (recognized by industry analysts as a leader in client/server computing), we've been building quite a reputation for ourselves. To the point that *Data Communications* has just voted our enterprise management service, with its end-to-end, 24/7 service and support program, one of their "Hot Products" for 1997. So why not look into our leasing and management programs. They'll ensure that your networks are always configured with the latest industry-standard technology for a surprisingly small amount of money. And those are just some of our programs.

Check out the others at [www.mci.com](http://www.mci.com) or call 1-800-338-6815, and leave your problems to us.



**.WORK THE WEB™**

# IN THIS BLOODTHIRSTY BUSINESS ARENA, IT'S BE IN CONTROL OF YOUR INFORMATION FLOW OR GET CRUSHED UNDER IT



## LOTUS NOTES® 4.5. WORKING THE WEB TO WORK TOGETHER BETTER.

Alright, so there's a lot going on in your day: managing e-mail, sharing work, juggling your calendar, coordinating appointments and staying on top of web-based information that changes every minute. Hey, that's business. And since you're not going to get any sympathy, you'd do well to get Lotus Notes 4.5. It's designed to leverage the power of the Web so you can work more closely with your colleagues, and put all the information your job demands right there on your desktop.

**A PLACE WHERE YOU CAN REALLY GET SOME WORK DONE.** Lotus Notes 4.5 is your central access point for all information in the business world. It ensures that the information you depend on is literally up-to-the-second, and that you become aware when something important changes – whether it's the starting time for your afternoon meeting or an update to a website that's vital to your business.

Notes is now thoroughly tied to the Web, so it not only gives you direct access to the expanding universe, it lets you update the content of your company website directly. It even helps you stay productive while you're off-line, stuck on a plane or wherever.

Notes has always been about working together better. In its latest version, it's also the best Internet client, so you can move to a whole new level of web-based collaboration – and get on top of all that information before it gets on top of you. Find out more about how you can use Lotus Notes 4.5 to do your job better by visiting our website at [www.lotus.com](http://www.lotus.com).

## NOTES 4.5

- E-MAIL
- INTRANET/INTERNET
- WORKFLOW
- GROUP SCHEDULING
- CALENDARING
- GROUPWARE APPS
- DOCUMENT MANAGEMENT
- DISCUSSIONS
- AGENTS
- ENTERPRISE DATA
- JAVA® APPS
- LOTUS COMPONENTS™

Lotus

Working Together™

# CD storage revs up

## ► Software eliminates premastering process

By Matt Hamblen

**SMART STORAGE**, Inc. next week plans to introduce software that eliminates the laborious premastering process when storing information on compact discs for use in a CD jukebox.

The SmartCD software allows "CD recording to be as easy as saving data to a hard disk," said Michael Peterson, president of Strategic Research Corp. in Santa Barbara, Calif.

Andover, Mass.-based Smart Storage will introduce the software at the AIIM '97 (Association for Information and Image Management) show next week in New York.

### ADVANTAGES

There are plenty of advantages to using CDs for storage, analysts said. CDs are small, durable and can run on any PC equipped with a CD-ROM drive. Analysts said the SmartCD software may help increase the popularity of CDs used to archive data in large organizations.

Fleet N.A. in Hartford, Conn., is using the latest beta version of SmartCD on Windows NT 4.0 to write CDs that store scanned copies of canceled checks for hundreds of commercial customers, including insurance companies. Federal law requires that companies

**AIIM '97**  
SHOW

keep check archives for seven years.

"It's working real good, with increased throughput and good control," said Robert Claus, vice president of systems and technology at Fleet. "[The software] can multiread, which means it can perform more than one function at the same time.

So we can load data to the CD writer, and while it's writing a CD, we can load more data for another CD."

Fleet also scans both sides of canceled checks and can store the data at its site or ship customers the written CDs with labels.

A staff of 10 handles CD scanning and writing around the clock, so Fleet can archive a million to 3 million checks per month, Claus said. The bank produces about 150 CDs' worth of checks in a month, he said.

SmartCD also is being used to control the robotics of Fleet's CD jukebox from Eastman Kodak Co. in Rochester, N.Y. The jukebox holds 75 CDs and moves each CD to a writer drive. By eliminating the premastering process, Claus said he has reduced his CD writing time from up to an hour to about 20 minutes.

Each blank CD-Recordable disc costs about \$9. Each check image costs a cents. Customers

can take the CDs and play them on jukeboxes in their own offices for near-line retrieval. That reduces the time it takes to find an old check from one to two days via the old microfilm method to about 30 seconds with CDs in a jukebox.

"Customers can pull up a check almost instantly to check for fraud or other questions," Claus said.

Adaptec, Inc. in Milpitas, Calif., recently released DirectCD for writing a single CD on a desktop PC by moving a file directly to a drive letter without premastering.

### STEPS IN PREMASTERING

- 1 Define contents to write
- 2 Identify the format
- 3 Gather data on a hard disk
- 4 Create an International Standards Organization image
- 5 Copy the image to a CD-Recordable disc

Smart Storage's competitor to DirectCD is FloppyCD.

Smart Storage plans to ship DirectCD for jukebox usage in the summer for NT and in the fall for Unix and Novell NetWare, company officials said.

Analysts added that SmartCD may lead a market segment that will be popular for perhaps another two years. Then, they said, Digital Video Discs may begin to eclipse CD-Recordable technology. □

# Minolta to spin off its imaging systems line

By Barb Cole-Gomolka

**MINOLTA CORP.** later this month will spin off its imaging systems business as a separate company that will introduce a new line of imaging software and hardware.

Minolta Information Systems, Inc. will take over development and support of Minolta's imaging products and launch a line of component-based imaging software and storage management devices, said Glenn Magpell, president of the subsidiary.

### NEW YORK DEBUT

Minolta is expected to announce the plan at the AIIM '97 (Association for Information and Image Management) show next week in New York.

"This gives me a greater sense of Minolta's commitment [to its imaging business]," said JoAnne Olson, director of member relations at Health Insurance Plan of Greater New York.

"Direct marketers understand that an effective global E-MPS system will allow them to be responsive to consumers who desire not to receive unsolicited marketing E-mail," said H. Robert Wientzen, president and CEO of DMA, in a prepared statement.

"Such a free-choice system is essential for online marketing success," Wientzen said.

The association said it hopes to have the system up and operating six months after it awards a contract.

The deadline for submitting proposals is May 5. □

a health maintenance organization that uses Minolta's imaging system. She explained that segregating that line of business could make it easier to deal with the company and get information about the company's imaging products.

Minolta hopes the new subsidiary will fill the need that large companies have for far-reaching imaging systems that handle everything from desktop image processing to back-end storage, Magpell said. It will compete against veterans such as IBM and FileNet Corp.

The spin-off initially will target the medical industry, government and the distribution and order-processing niches. Its DocX product line will be aimed at companies that seek to knit together imaging components — including those from other vendors — into one development environment.

Also planned is a server to handle high-speed image processing and character recognition.

### READY, AIIM, FIRE

The following products will be highlighted this week at AIIM '97:

Company	Product	Function	Availability
Datacap	Paper Keyboard 97	Data and image capturing software for Windows 95 and Windows NT	May 1
JetForm	JetForm Workflow 2.0	Server-based workflow for messaging and database systems	End of April
RightAngle Systems	Motiva	Product life-cycle management system based on Microsoft's Distributed Component Object Model	Q2 '97

**Technology**

Client/Server

Windows™-based  
InterfaceInternet-enabled  
Applications**Product  
Features**Fully embedded  
Self-Service  
Applications

- Employee
- Manager

**Workflow**Integrated Decision  
Support SystemComprehensive  
HR Functions

- Training and Development
- Compensation Management
- Position Management
- Career Development and Succession Planning

**Payroll Options**Best-of-Breed  
Integrated  
SolutionsImplementation and Service  
Options

She has a  
hyphenated surname,  
and a telecommuting mom.  
But to our HR system,  
she's just another  
bundle of joy.

Updating complicated personal files is enough to make any HR manager cranky. Which is why your company should consider a change to a CSS HRizon™ System from ADP.

CSS HRizon offers the only HRMS with fully embedded Employee Self-Service and Manager Self-Service features, both of which are Internet-enabled. Which means, now, managers and employees can access and update HR information whether they're working at the office, at home, or on the road. In addition, CSS HRizon provides a wide range of other solutions. From rapid implementation to IT outsourcing, ADP has a system that's designed to fit the way you do business.

The advantages of choosing a CSS HRizon System don't end there. Because we'll provide a support team to guide you from current system analysis to new system implementation to ongoing maintenance.

No wonder over 5,000 companies rely on ADP for HR solutions. Solutions that seamlessly integrate your HR, benefits, and payroll information.

To find out how CSS HRizon can bring newfound joy to your HR department, visit us at [adp.com](http://adp.com) or call for a free demo on CD-ROM.

**1 800 CALL ADP****ext. 400**[www.adp.com](http://www.adp.com)*Focus on what matters*

with data located behind a variety of different operating systems—  
UNIX, MVS. The key thing we're trying to do is pool that data from all sources and create a market out of it. We researched this new information and

Phil Orton, Director of Centralized Operations, Energy Corporation



ety or  
T,  
we're  
together  
informa-  
the  
us deve-  
r.

## ***Not Without EMC Enterprise Storage They Won't.***

Consolidating information for business results is nothing more than wishful thinking without EMC Enterprise Storage.™ With EMC at the center of the IT enterprise, business leaders now have the tools they need to leverage all of their information into a powerful competitive advantage. Finally, vast amounts of information can be managed, stored, protected, and rapidly shared simultaneously across all platforms — mainframe,

open systems, NT, AS/400, you name

it. EMC Enterprise Storage. For

companies that want to grow as quickly

as their information. To learn more,

visit our Web site at [www.emc.com](http://www.emc.com), or call

1-800-424-EMC2, ext. 382.

**EMC<sup>2</sup>**  
The Enterprise Storage Company

# Briefs

## New Wang president

Wang Laboratories, Inc. in Billerica, Mass., last week appointed Jose Ofman as its new president and chief operating officer for the Americas. Before joining Wang, Ofman was a corporate vice president and group executive at Electronic Data Systems Corp.

Also last week, Wang said it agreed to pay \$4 million in cash and nearly \$4 million in stock options to CEO Joseph M. Tucci as part of an incentive package to stay with the company. Wang also increased Tucci's base salary from \$605,000 to \$750,000 "to equalize his pay with other CEOs," according to the company.

## Software AG spin-off

Software AG has spun off its North American subsidiary, Software AG Americas, as a separate software company based in Reston, Va. Thayer Capital Partners, a Washington-based venture research firm, bought a majority interest in Software AG Americas to make the deal possible. In a long-term partnership agreement, Software AG Americas will continue to resell products from the German company. It also plans to expand its own product line through development, partnering and acquisitions. Daniel F. Gillis was named president and CEO.

# Computer Industry

## Focus on object database trips Informix

### Object database focus blamed for Q1 debacle

By Craig Stedman

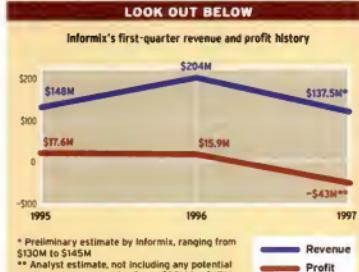
SUDDENLY, Informix Software, Inc. looks less like a threat to Oracle Corp. and more like a beligerent brother-in-arms with Sybase, Inc.

Si Informix users last week said they weren't spooked by the database vendor's stunning announcement that it will report a whopper of a first-quarter loss on sales almost 50% below what financial analysts had projected. Most of them chalked up the unpleasant surprise to short-term issues that stem from Informix's aggressive marketing of its Universal Server database.

But analysts said the magnitude of the expected loss and revenue drop-off will likely leave Informix reeling until late this year at best. And with Emeryville, Calif.-based Sybase still trying to recover from three straight quarterly losses last year, Informix's woes leave Redwood Shores, Calif.-based Oracle looking down securely from its database perch at a pair of weakened rivals.

"The size of Informix's miss is just monumental. It ranks with the all-time major disappointments," said James Pickrel, a database securities analyst at Hambrecht & Quist, Inc. in San Francisco.

Pickrel had expected a first-



quarter profit of almost \$20 million on revenue of \$255 million for the Menlo Park, Calif., company. His revised prediction is a loss in the \$40 million range after Informix said sales could be as low as \$130 million. Pickrel cut his revenue forecast for all of 1997 from \$1.2 billion to \$715 million — a 40% whack.

Informix executives and outsiders blamed the first-quarter debacle on two main failings: Too much marketing hoopla was invested in Universal Server at a time when most users weren't ready for its object relational features, and a major sales force reorganization that was started in late 1996 wasn't executed well.

"You need to preach your vision and sell your products, but

Informix has been selling its vision and ignoring its real products," said Gary Thomson, vice president of information systems technology at Choice Hotels International, Inc. in Phoenix, a big Informix user.

**"Informix has been selling its vision and ignoring its real products."**

**- Gary Thomson, Choice Hotels**

Nevertheless, Thomson said he remains an Informix fan and may use Universal Server to add Internet and text support to the hotel chain's reservation system. "I think they're ahead technically, and one bad quarter

doesn't mean they're going down the drain," he said.

Universal Server is also only available on two Unix platforms now, and even some users who develop applications for the new database said they need promised functionality additions before they can go live with the software.

"We don't buy betas, and for our needs, it's a beta product," said Brad Jensen, a vice president at Sabre Decision Technologies, the software development arm of AMR Corp. in Fort Worth, Texas. But the impending loss "doesn't scare me at all," Jensen said. "It's pretty clear that Informix is still ahead of Oracle in this embedded object concept."

Brett Bachman, general manager of enterprise products at Informix, declined to discuss the financial situation during a separate telephone briefing. But

he said Informix now plans to "redouble our efforts" to market its mainstay Online relational database family.

The announcement sent Informix's stock price tumbling by 40% last Tuesday and Wednesday. Company officials wouldn't say whether any layoffs, management changes or product scrutinies will follow when full results are released later this month. □

## MERGERS

### Ascend to buy Cascade in bid to challenge Cisco on WAN turf

By Kim Girard

ASCEND Communications, Inc. capped off a recent spending spree last week with a \$3.7 billion offer to purchase Cascade Communications Corp. The deal puts Ascend in position to compete with market leader Cisco Systems, Inc. in the wide-area network market.

But Ascend's stock tumbled last week after some analysts said the remote access vendor paid too much for the Westford,

Mass.-based switch maker. Analysts are anticipating weaker-than-expected first-quarter earnings from Cascade.

Analysts did say the deal will provide Ascend with the end-to-end product line needed to better compete with Cisco, which acquired Cascade's biggest competitor, StrataCom, Inc., in a \$4 billion stock deal last year.

But Ascend's stock plummeted \$11.25 to \$40.75 per share last Monday, whittling the value of the stock swap deal.

Greg Rossmann, a principal at Broadview Associates, a mergers consulting firm in Fort Lee, N.J., said the tumble may reflect doubt about Ascend's ability to integrate the product lines. "The biggest challenge is creating an integrated suite of products, a pricing matrix that's rational and a customer support system," he said.

Through the deal, Ascend will add Cascade's frame relay and Asynchronous Transfer Mode (ATM) switch offerings to its remote access product line.

Last month, Alameda, Calif.-based Ascend pledged \$70 million to buy Whetstone, Inc., a developer of LAN switching products based on Ethernet and ATM. In January, Ascend spent

\$29 million for StonyBrook Services, Inc. to acquire its network management applications.

With Cascade, Ascend will be able to satisfy the networking equipment needs of Internet service providers — where Ascend has focused its energy and carrier central offices, according to Christine Heckart, an analyst at TeleChoice, Inc. in Vernon, N.J.

## HOW MUCH DID IT COST?

The top three networking deals in the past 12 months

3Com and U.S. Robotics (pending)	\$6.5 billion
Cisco and StrataCom	\$3.7 billion
Ascend and Cascade (proposed)	\$3.7 billion

The deal, which must be approved by the government and stockholders of both companies, is expected to close in the third quarter. Under the agreement, Cascade President and CEO Dan Smith will join Ascend as executive vice president and general manager of the switching systems unit, and Mary Ejabat will continue as Ascend's president and CEO. □

# You Can't Survive Without It.

## The Internet Commerce Expo.



April 8-11, 1997 • Atlanta, Georgia

September 8-11, 1997 • Los Angeles, California

The World's Premiere Exposition and Conference Dedicated To Internet Commerce and the Intranet.

The Internet Commerce Expo brings innovative solution providers and knowledgeable buyers together in a powerful Internet technology exposition and conference. It's your chance to get in on the hottest Internet action in the country. Don't miss it!

**For Exhibitors:** highly qualified, enterprise buyers will be there.

There will be thousands of motivated buyers actively looking for the new products that have made the Intranet and Internet commerce practical and secure. There is simply no better way to reach this hot-to-buy audience than ICE. Corporate decision makers will be there in huge numbers looking for productivity enhancing solutions... and they'll find what they're looking for at ICE.

**For Attendees:** the coolest way to find the hottest IT solutions.

Hundreds of the leading hardware, software and network services vendors will be on hand to show you how to increase productivity and profitability via the latest Internet technology. ICE is the best and biggest event in the country for getting directly in touch with the providers of the hottest Internet solutions for the enterprise. That's why this is the show you simply cannot afford to miss. If you can attend just one show this year, better make it ICE.

In addition, the focused content of Internet Commerce Expo's industry-leading conference program will address the needs of developers, IT and business managers and senior executives.

**ICE. If it's hot it's here.**

There's a hard new truth in the world of business today, and it goes like this: Internet commerce is the force driving business into the next millennium. So if you're a vendor with a compelling Internet solution for the enterprise... or a corporate decision maker looking for productivity enhancing products, you need to be where it's hot.

See ICE on the Web: <http://www.idg.com/ice>



April 8-11, 1997

Georgia World Congress Center  
Atlanta, Georgia

September 8-11, 1997

Los Angeles Convention Center  
Los Angeles, California

Sponsored by:

COMPUTERWORLD  
NetworkWorld

SunWorld



WEBMASTER

Please put me on ICE! I would like more information on:  Exhibiting  Attending  
 Atlanta  Los Angeles

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_

e-Mail \_\_\_\_\_

Mail to: Internet Commerce Expo, 111 Speen Street, P.O. Box 9107, Framingham, MA 01701. Or Fax to: 508-370-4325. Phone: 800-867-4ICE

CW

ICE, the ICE logo, Internet Commerce Expo and Internet Solutions for the Enterprise are service marks of International Data Group.

## OPINION

## Users need it all

Notebook computer makers and their users are on different pages, and it's

the vendor community that must change if it hopes to drive new generations of business applications.

It's easy to be amazed at how much power today's notebooks pack. We carry near-desktop capabilities in a briefcase and can run video clips with the sound and the fury of the latest action flick. But despite the progress, notebooks just don't have the reliability, integration and ease of use that users need.

A recent *Computerworld* article detailed how IS managers and users are frustrated with notebooks that

break during normal use.

Vendor counter that users ask for the moon, demanding feature-packed notebooks that are light and inexpensive, yet durable — an unlikely combination. Another story detailed a

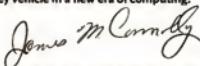
study that showed an even greater user/vendor disconnect: Vendors promote faster chips while notebook users beg for greater battery life and compatibility between hardware and software.

What do users really want? All of it — power, storage, durability and usability — and for good reason.

The advanced applications we've talked about for years promise access to all your information wherever you happen to be. Gee-whiz features such as universal messaging are useful only if you can get to them in the same way from your office, home and an airport lounge.

Tomorrow's notebook will need the capabilities found in the desktop PC. The needed improvements, besides durability, range from common log-on scripts to CD-ROM drives that are standard equipment.

The challenge for notebook vendors is to provide all of this while hitting the customer's price point and weight limit. Various alternatives — such as Web-enabled cellular phones and network computers — already are chipping away at key notebook sectors. If notebook vendors don't move quickly, they risk losing their place as a key vehicle in a new era of computing.



James Connolly, technology evaluations editor  
Internet: [james\\_connolly@cw.com](mailto:james_connolly@cw.com)



## LETTERS

### Network with online seekers

### Intranets hold legal peril

### A new twist on year 2000

REGARDING YOUR Feb. 10 article on Internet recruiting ["IS: Point-and-click recruiting falls short"]: After working with the Internet for about five months, I have hired only two people directly from the Web. But through conversations with people who have their resumes on the Web, numerous qualified potential employees have been referred to me.

Any good recruiter knows you're not going to get your most qualified, interested and affordable candidate on the first try. Network with them, and your success will be your reward.

Brandon Reiff  
IT recruiting consultant  
R. D. Raab and Co.  
Glen Allen, Va.

### Bias against Apple is clear

WHILE APPLE USERS complain of the media's bias against the company, publications such as *Computerworld* vigorously deny this. Yet a clear instance of bias appeared in your Feb. 17 issue on the front page.

The headline [in the "Inside this Issue" box] says, "First 200-MHz laptop" ignoring the three high-end Macintosh PowerBooks released the same week running at 240, 200 and 180 MHz. Please discard your blinders and recognize there is some real good stuff out there. You should be informing your readers about it; otherwise, how am I going to trust a reputed journal to keep me updated?

Maril Nagasundaram  
Assistant professor,  
computer information systems  
Boise State University  
Boise, Idaho

READ WITH interest the article on becoming Web-enabled via suite software ["Users getting Web-enabled," CW, Feb. 3]. The author quoted companies where once inaccessible information is now served up by department web pages routinely. As a lawyer who occasionally drafts discovery of electronic materials, this started me thinking about how the information for legal cases might be developed in the future.

Imagine court-sanctioned or required browsing of your corporate intranet by an opposing party in a lawsuit. Or such parties having access to the same web pages that company employees do. Or being granted special access to all pages mounted. In some ways, intranets make legal discovery ridiculously easy. Think about it.

David McIlvain  
Potomac, Md.

### No money in high-end NT

NICE JOB on the Feb. 10 story "Unix holds high ground against NT." This has major implications for the millions of NT developers who are hoping to make big bucks selling high-end operating system and application tools.

They probably won't make the dough, due to Unix holding on to the high end. NT users have a mental block about paying big bucks for anything. The biggest winner will probably be Microsoft, as it sticks the functionality into NT for free or for a very modest fee. Of course, users will win too, having to pay less for more.

Dave Buerger  
Duluth, Ga.

BECAUSE OF my job, I am very concerned about the year 2000 problem. Fortunately, your magazine has done an excellent job keeping this issue in the forefront.

I have discovered a new twist on the problem, which I have yet to read about in any of the trade journals. According to the *Encyclopaedia Britannica*, 2000

(which is evenly divisible by 400) is not a leap year. Therefore, Feb. 29, 2000, is not a valid date.

So far, we have tested several of our key application platforms: Windows 95, Lotus 1-2-3 for Windows Version 5.0, HP-UX 9.04 calendar command and Advanced Pick 6.1.6.

All these programs incorrectly recognize Feb. 29, 2000, as a valid date. I suspect this problem is widespread and would like to bring it to your attention.

Mark L. Olsen  
Director of information services  
Acme Parking  
San Diego

Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: [letters@cw.com](mailto:letters@cw.com). Please include an address and phone number for verification.

# Death of the computer salesman

Patricia B. Seybold

**F**or years, the process of buying computers was very stable. You either walked into a store, called an 800 number, placed an order with a reseller or dealt with a manufacturer's sales representative. But World Wide Web commerce is about to change all that — for the better.

Most of the computer industry relies on expensive, multilayered distribution channels. Manufacturers pass products to distributors, who provide them to resellers, who configure the products and deliver them to end users. The biggest cost is keeping the entire pipeline filled with inventory.

A few manufacturers, such as Dell, sell and deliver directly to customers. Many vendors sell directly to their largest accounts, but configuration, delivery and installation are often handled by third parties.

But with the Web, it's now possible to go online, configure computers to meet



## Web commerce promises to revamp the process of buying computers.

your particular needs and do comparison shopping, assessing the trade-offs among features, price and availability. You can place an order directly from many Web sites, and that order will be filled within a specified period of time — often by the next day. Not only are PCs and peripherals being sold this way today, but so are workstations and pretty sizable servers.

The next-generation configuration engines coming to the Web will ask you which applications you want to run and

with what kind of user and transaction loads. The engines will then recommend the right models and options for your needs.

Soon you won't want or need to call your friendly computer salesman. You'll have all the information you need at your fingertips.

Smart resellers and manufacturers, following Dell's lead, are building (or have built) "configure and buy" Web systems. Although they have voiced concerns about competing with their other distribution channels, the pressure is on for them to sell directly to any qualified customer who prefers to deal directly with the manufacturer.

These online configuration and quoting capabilities will prove valuable for the corporate computing "influencers" — the people who decide which computers your company should use for particular kinds of applications — as well as the power users who want to specify their own machines.

But buyers in the IS purchasing department will need an additional layer of functionality that will soon be on the market. The purchasing department needs to negotiate quantity discounts, service contracts and other terms and

conditions for the makes and models of computers the influencers have selected. Once that is done, the company can let end users shop online through a Web interface that automatically configures the products and prices to comply with the company's terms and conditions.

Through this, end users will order only approved products, under prenegotiated terms. Workflow software can then automatically generate a requisition, route it to the user's manager for approval, send it to the purchasing department for approval, generate a purchase order and track the delivery.

Thanks to the revolution in Web commerce, we'll soon have a streamlined buying process with cost savings and economies for all involved. Manufacturers can build to order. Resellers won't have to stock inventory. Logistics companies can ship products as they're built. Influencers and end users can select what they want from a database of what's available when they need it. And purchasing departments can control and monitor expenses.

Sounds good to me. What's not to like? □

**Seybold** is president of *Patricia Seybold Group* in Boston. Her Internet address is [seybold@pggroup.com](mailto:seybold@pggroup.com).

# Make peace with guerrilla intranets

Michael Schrage

**B**ack-of-the-envelope calculations always risk embarrassment. But an intriguing article in last month's *PC World* on do-it-yourself intranets provoked me into whipping out my Sharp Wizard to do a bit of retrospective math on the economics of departmental computing.

The numbers were compelling: In hard-dollar terms, it's less expensive to set up a departmental intranet in 1997 than it was to set up a departmental desktop publishing operation in 1987.

In other words, the economics of growing a grassroots intranet in the 1990s rival the economics of launching desktop publishing in the 1980s.

That raises questions that should interest every IS department in every Fortune 1,000 company.

Could we possibly be experiencing déjà vu all over again? Are surreptitious intranets being covertly funded by innovative departments today, just as "office supplies" budgets subsidized the purchase of PCs and laser printers more

than a decade ago? Could we see intranet power users evolve in ways analogous to power users of PCs?

Within 90 minutes of landing in Chicago — I read *PC World* on the plane; you don't think I actually subscribe, do you? — I had called two friends at giant companies to find out if, indeed, their organizations had spawned non-IS-sponsored, grassroots departmental intranets. Shall we call them "intranettes"?

Two days later, I got E-mail that made me smile. Much to their surprise, my friends had discovered more than 10 unauthorized intranettes between them. The bottom-up, bootleg

quality that marked the rise of the corporate PC had a strong intranet echo at their companies.

Of course, generalizations about intranets are even riskier than back-of-the-envelope calculations. Then again, there is a persisent economic logic to the rise of intranettes that's every bit as compelling as the rise of enterprise intranets. If IS departments aren't swiftly and creatively responsive to the networking needs of their departmental constituents, why shouldn't intranettes be an appropriate response?

Precisely because intranets manifest the ethos of decentralization, an embarrassment of intranet riches makes every bit as much

economic sense as a top-down, IS-sanc-

tioned intranet.

I don't believe for a moment that a typical Fortune 1,000 organization will see a war between its bootleg intranet and the sanctioned intranet. But just as power users drove PC penetration and IS departments crazy during the past decade, isn't it plausible that intranet-innovative departments will wield a powerful influence on the pervasiveness and potential of the corporate intranet? Many companies don't have a clue how many intranettes are running intradepartmental communications and collaborations.

Maybe an "intranet audit" isn't a bad idea. But a better idea would be to consider knitting intranettes together as the best way to grow the organization's intranet.

Should IS champion top-down or bottom-up distributed architectures? The answer to that question seems to be becoming less and less clear. □

**The best way to grow the intranet may be to knit together the "intranettes."**



**Schrage** is a research associate at the MIT Media Lab and author of *No More Teams!* His Internet address is [schrage@mit.edu](mailto:schrage@mit.edu).

# How long will it take before you with their credit

{ Imagine if it



The impact on your business would be enormous. The ROI nearly immediate. But the revenues generated from secure credit card transactions are just the beginning. Suddenly you're able to share confidential information over the Internet with your customers, employees and business partners. Your business becomes more efficient and competitive.

So what does it take to begin? A partner who truly understands the impact networking can have on your business, and knows how to implement it down to the last strand of wire and the last packet of data. We're that partner. Our technologies

# your customers finally trust cards over the Internet?

happened next month. }

made the Internet a global reality. Today, Cisco networking products and Cisco IOS™ software are making the Internet safe for secure business transactions of all kinds. Call us at 1-800-778-3632, ext. 192000.

Or visit our Web site at [www.cisco.com](http://www.cisco.com)

After all, there's no reason to keep your customers waiting.

The network works. No excuses.™

**CISCO SYSTEMS**



## COMMENTARY

## Novell can't do it alone

DAVID MOSCHELLA

**H**AS NOVELL TURNED the corner? The answer depends on how Novell handles the follow-

ing market realities. All things being equal, it's easier for customers to use one software supplier rather than two.

To prosper in an increasingly Windows NT-driven industry, Novell must provide enough value to warrant a multivendor approach. Then it must successfully communicate that value to new and existing customers.

A corollary to this theory is that the bigger the company, the more likely it is



to use multiple vendors. Small businesses often choose Microsoft or Novell, but increasingly they choose the former. In the *Fortune 500*, there is often plenty of room for both. The middle is where the decisive competition will occur.

Because Novell's product strategy is now mostly in place, its focus has shifted to sales and marketing. Enter Eric Schmidt. Although many have emphasized Schmidt's "visionary" status, his main task will be articulation. Few people are better qualified to make the technical, business and intellectual case that a layered, multivendor network software environment is — and will continue to be — the optimal customer path.

But it isn't enough just to say you offer real customer value. In today's competitive ecosystem, the support of other industry leaders is a critical part of the marketing message. Here, despite the recent flurry of agreements, the picture is still mixed. Although Novell's formal cooperation with Sun, Hewlett-Packard, Oracle and Netscape sounds promising, even a quick analysis reveals that the enthusiasm of those four players is considerably less than at full throttle.

HP was once the most neutral of IT vendors, but now it is firmly in the WinTel camp. Sun will work with Novell to promote Java, but NetWare and Solaris are anything but natural allies. Oracle's decisions to license Novell Directory Services (NDS) and set up a separate Novell applications division are, at best, modest steps. Meanwhile, IBM and Lotus remain notable missing persons.

Finally, when Netscape and Novell chose to set up a separate company called Novonyx, they acknowledged a real customer need but admitted that their two organizations couldn't effectively work together. If anything should have been sold or spun out as a separate company, it's probably Novell's GroupWise. The success of this product compromises Novell's position as a pure layered infrastructure provider and makes cooperation with other groupware vendors, such as Lotus/IBM and Netscape, so difficult.

Novell finally has the market's attention, but unless the latest round of partnerships quickly delivers useful products and services, the momentum soon will dissipate. The software industry has a real opportunity to establish major new non-Microsoft controlled standards — Java, Common Object Request Broker Architecture, Lightweight Directory Access Protocol, NDS and so on — but such opportunities have been squandered many times before.

Compared with the Microsoft juggernaut, the current level of cooperation, although improving, still looks too timid and too fragile. What ever happened to the concept of taking bold action? □

## Coming in the April 14th issue of Computerworld

### Managing the Next Generation of Web Applications

A COMPUTERWORLD White Paper

The World Wide Web has ushered in a new perspective on the rate of change in information technology today.

As an application platform, the Web is growing exponentially. And products are evolving at "Web speed," with new releases arriving in months instead of one or two years.

It is increasingly difficult for IT professionals to adapt to this rate of change and to users' insatiable requirements for access to information on the Web. This environment has created the need for comprehensive management tools — tools that are converging with new DBMS capabilities to create an intelligent Web information manager.

Judith R. Davis, principal with InfoIT, Inc., a DataBase Associates International company, and author of this White Paper, defines the requirements for an intelligent Web information manager and describes why this is becoming a key role for the ORDBMS — the object relational database management system.

Sponsored by:  INFORMIX®



Written by:  DATABASE ASSOCIATES INTERNATIONAL

*Moschella is senior vice president of research at Computerworld, Inc. and author of "Waves of Power, The Dynamics of Global Technology Leadership (Amacom). His address is [david\\_moschella@cu.com](mailto:david_moschella@cu.com).*



What do you call it when industry leaders give everyone access to killer apps and ideas that map the future of digital document production?

Call it DocuWorld.



There has never been anything like DocuWorld. It begins May 13 and 14 in cities around the world. It's a live and virtual event where 12,000 people will see killer applications, new products, emerging technologies and end-to-end solutions from Xerox and other leaders of the digital document revolution. It's the latest word in efficient and effective document

production. DocuWorld is also a continuing community on the Internet. It's where customers and companies can explore new solutions together. Discover new opportunities. And map out the frontiers of digital document production. If you want to register for DocuWorld, just visit our Web site at: [www.docuworld.com](http://www.docuworld.com). Or give us a call at 1-888-DocuWorld.

XEROX®, The Document Company®, DocuWorld and the digital X are trademarks of XEROX CORPORATION. All company names and logos are trademarks of their respective owners. 36 USC 300.

THE  
DOCUMENT  
COMPANY  
XEROX

# Now that APC Smart-UPS® ships with protecting network uptime



APC's Smart-UPS are also available in a convenient rack-mount version. Ask about NetShelter premium enclosures with 100% Compaq compatibility for 20% less.

APC's new MasterSwitch™ provides Web/SNMP manageable, independent control of power to connected loads.



© Copyright 1996  
American Power Conversion  
All Rights Reserved

Support for Windows 3.1, Windows 95, Windows NT and Novell Network  
Licensed material, program property of American Power Conversion, 21-131  
12 Fairgrounds Road, West Kingston, Rhode Island 02892  
Unauthorized use, duplication or distribution  
is strictly prohibited by federal law.

Smart-UPS

1 0 0 0

APC

"...The easiest server protection I know of... the APC software is the best I've seen..."

— Jerry Pournelle, BYTE online/Chaos Manor Oct. 1, 1996

"...Inherent flexibility and excellent software... Don't be caught without one."

— PC Magazine

**PC**  
MAGAZINE  
EDITORS' CHOICE

November 19, 1996  
APC Smart-UPS 1000

APC has won more awards for reliability  
than all other UPS vendors combined.



# new web-enabled PowerChute® plus, has never been easier



For clean reliable power, experts, network managers and computer users worldwide prefer one solution above all others combined: APC Smart-UPS with PowerChute® plus power management and diagnostic software. Now this most reliable power protection solution comes in one box.

## Complete & easy to use

You'll get complete protection against power spikes, surges, brownouts, and blackouts, maintaining maximum up-time of your servers and decreasing management costs.

## Web Server & SNMP ready

Administrators get the benefit of graceful, unattended Web server shutdown. PowerChute® plus alerts managers and users, and averts power problems before they result in costly downtime – all without the need for additional support staff. PowerChute® plus' FlexEvents™ feature can page you when an out-of-bounds environmental condition occurs or physical security is violated. APC's NEW WebAgent™



PowerChute® plus provides unattended system shutdown and UPS management for Windows NT, Network and other operating systems. Manage your APC Smart-UPS via SNMP, DMI and Web browsers (shown above). Features vary by operating system.

allows administrators to monitor and manage their Smart-UPS via their Web browser. NEW WebAlert™ notifies users of Web server shutdown via their browser. PowerChute® plus, with its included PowerNet™ SNMP agent plug-in, provides remote power management and environmental monitoring.



SmartSlot accessories plug directly into Smart-UPS and provide support for SNMP, environmental (temp. & humidity) and remote out-of-bounds power management

Bill Michael  
MSI Site Manager  
Centra RE Insurance

"We've used APC here for at least 3 years – it is de facto standard. Their PowerAudit engineers tested the power in our building, and found inadequacies which threatened our network and SAP system. The combination of custom software, on-site consulting and high quality power protection products have given us the full tolerance that we need to protect our investment."

\*source: InfoWorld 1996



## Trade-UPS!

Fax or mail this coupon to APC and learn how you can easily trade in your old UPS for discounts towards a new Smart-UPS.



YES I'm interested in trading up to an older competitor's or APC UPS to Smart-UPS. Please send Trade-UPS info.

NO I'm not interested at this time but please send my FREE power protection handbook.

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/Town: \_\_\_\_\_

State: \_\_\_\_\_ Zip: \_\_\_\_\_ Country: \_\_\_\_\_

Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

How many servers on site? \_\_\_\_\_

Brand of UPS used? \_\_\_\_\_

### Dept. AB-80

(800)347-FAXX PowerFax • CompuServe: GO APCSUPPORT  
E-mail: apcc@apc.com

132 Fairgrounds Road, West Kingston, RI 02892 USA

©1996 APC. All trademarks are the property of their owners. SU1996

CHOOSE THE SMART-UPS THAT IS RIGHT FOR YOU			
VA Rating	Part#	Runtime*	Sug. List Price
700	SU700NET	5	\$499
1000	SU1000NET	11	\$699
1400	SU1400NET	21	\$879
2200	SU2200NET	50	\$1499
3000	SU3000NET	46	\$2599

\*Hours of Power Protection (estimated) based on APC's PowerGuard® plus power management software.

power protection: APC Smart-UPS. With CellGuard™ intelligent battery management you get increased reliability and extended battery life. Hotswappable, user-replaceable batteries and FastCharge (four times faster than competitors) mean Web server integrity and peace of mind. It's no wonder over six million satisfied customers worldwide say "ProtectME! with APC." Server protection and peace of mind have never been easier.

# APC®

**(888) 289-APCC x7049**

Fax: (401) 788-2787

<http://www.apc.com>



# Servers & PCs

Large Systems • Workstations • Portable Computing

## Briefs

### AS/400 network tool

Next month, users will be able to download software from IBM that lets them manage network computers attached to an AS/400.

Network Station Manager for the AS/400 lets an administrator configure network computers via a graphical user interface management screen. The software also includes Java support and uses the AS/400's systems management and printing capabilities.

Users can download the software from the company's Web site at [www.internet.ibm.com/networkstation](http://www.internet.ibm.com/networkstation).

The recommended ratio of support staff to users:

#### Notebook users

**I-to-100**

#### Desktop workers

**I-to-117**

#### Sales force automation users

**I-to-60**

Source: Gartner Group, Inc., San Jose, Calif.

## Serial storage gains ground as users seek more speed

By Tim Ouellette

MORE USERS are getting their hands on open systems storage devices that use faster interconnect technology than traditional SCSI-based machines.

Growing interest in network computers and thin clients, along with pilot projects in data warehousing and intranets, have led to a surge in demand for storage and servers attached to disk arrays.

And users know that faster disk drives aren't enough to ensure they get the data they want, when they want it.

For example, USA Group, Inc. in Littleton, Colo., bought IBM's 7133 Serial Storage Architecture (SSA) disk system to warehouse huge amounts of data used to develop predictive models. The models help predict college enrollment, part of USA Group's education consulting business.

SSA uses two 20 MB byte/sec. full-duplex channels between

[Serial storage, page 44](#)

## Cards help net PCs get smart

### Cost savings cited for swipe-card technology

By April Jacobs

NEW SMART-CARD technology from IBM, Sun Microsystems, Inc., Oracle Corp., spin-off Network Computer, Inc. and Netscape Communications Corp. may make network computers more attractive during the next two years.

The companies have banded together to create OpenCard Framework, a standard that will make access to network computers by roaming users easier and let companies give end

Smart cards, a plug-in technology, will let users do the following:

- Act as roaming network computer users to gain access to files and other data
- Plug in to PCs anywhere on a corporate network
- Electronically download cash, which can be stored and used like an ATM transaction

users access to the machines with the swipe of a card (CW, March 31).

The potential for the corporate community is to save money on end-user moves, which

can be costly, and give multiple users access to a single machine based on their encoded privileges. Those privileges will be contained in an intelligent card

[Smart cards, page 46](#)

## Upgrade helps Win CE get in sync

By Mindy Blodgett

MICROSOFT CORP. continued to beat the Windows CE drum last week by announcing an upgrade to the operating system for handheld PCs, or personal digital assistants (PDA).

### Features of the NEC MobilePro 400, a handheld PC with the Windows CE operating system



- Weighs 13 ounces
- Has 2 MB bytes or 4 MB bytes of RAM
- Has one Type II PC Card slot and one infrared wireless port

Microsoft said Windows CE for PDAs will support data synchronization with Microsoft Outlook software and offer file formatting for Exchange and

Excel. Windows CE will also synchronize with users of Windows NT Workstation.

Microsoft and hardware vendor

[Microsoft, page 46](#)

## EVERYONE IS WATCHING THE BOTTOM LINE.

### NOW YOU CAN SEE IT TOO.

As imaging becomes mainstream, budgets and the demands on technology explode. Shouldn't you focus on the monitors engineered to satisfy MIS and finance departments alike? The Nokia 445X series.

Innovative FullScreen™ technology give these 21" systems a full square 19.7" workspace. The 1600 x 1200 pixel of pixels boast a dot pitch of just 22.16 mm. And the 445X Series can achieve a refresh rate of 150 Hz. In fact, Nokia is the first manufacturer to fulfill the new VESA™ standards for display clarity which "future-proofs" your decision.

What's more, ergonomic synergies allow the 445X to deliver a range of resolutions and refresh rates

mapped precisely to work in the real world. The result is a versatile tool for a spectrum of high-resolution imaging requirements. Rigorous adherence to new TCO'95, EnergyStar, and MPR-II standards is not compromised. So your contributions to productivity and fiscal responsibility come without trade-offs.

Don't you owe it to your entire organization to consider the 445X series? If you don't, you might consider having more than your eyes examined.

Please visit us at [www.nokia-americas.com](http://www.nokia-americas.com) or call us at 1.800.BY.NOKIA, Dept. N216.



**NOKIA**

# Serial storage gains ground as users seek speed

CONTINUED FROM PAGE 43

each array instead of the bulky parallel cabling that SCSI requires.

"We like the redundancy SSA brings so there are two links into the machine," said Andrew Ainslie, a database marketing consultant at USA Group.

"And SSA is a very simple connection to a large number of drives," Ainslie said. "It makes running different RAID architectures for different data sets easier."

Besides SSA, users can also choose between the popular Fibre Channel Arbitrated Loop (FC-AL) devices sold by a growing number of vendors, including Sun Microsystems, Inc., Amdahl Corp. and Data General Corp., and UltraSCSI, the next generation of SCSI technology (see chart).

## STILL WAITING

SSA and FC-AL address the scalability issues of SCSI by using simpler serial wiring and allowing many more servers to be hooked to one disk array. But these approaches don't yet work together, which forces users to wait another two years before

## SHORTS

### New notebook

**Micron Electronics, Inc.** in Nampa, Idaho, announced it will add midrange notebooks to its TransPort notebook line. The Micron TransPort VLX will be 1.6 in. thick. It will have 16MB bytes of RAM, a 1.44G-byte hard drive and a swappable bay for either a floppy disk drive or a CD-ROM. The VLX will have an 11.3-in. screen. Prices start at \$1,999. It is available now.

### Compression aid

**DataTools, Inc.** in Palo Alto, Calif., this week will announce Data Optimizer, a Unix compression tool that lets users scale up data warehouses without purchasing new disk storage systems. The software also balances the I/O workload for storage systems and can be set to automatically begin compression if a disk system is getting full. Pricing starts at \$5,000 for 45G bytes of storage space.

## STORAGE INTERCONNECTIVITY DEFINED

- **SCSI:** Current parallel standard interconnect format used by most storage devices (10M byte/sec.); offers limited scalability
- **16-bit UltraSCSI:** Doubles the data rate by increasing the bandwidth of SCSI technology (20M byte/sec.)
- **Fibre Channel Arbitrated Loop (FC-AL):** Uses serial cabling and can support up to 100M byte/sec.
- **Serial Storage Architecture (SSA):** IBM interface that also uses serial cabling; it uses two 20M byte/sec. full-duplex channels between each array
- **Fibre Channel Enhanced Loop (FC-EL):** Planned for 1999, it will combine SSA's full-duplex features with FC-AL's fixed identification methods

products emerge under a single interconnect standard called Fibre Channel Enhanced Loop (FC-EL). Until then, observers said all approaches will give users short-term performance

benefits, although some additional bridging products will have to be installed to make SSA and UltraSCSI work with FC-EL.

But users seem willing to buy to get those gains.

IBM recently announced that it has sold 1,000T bytes of its SSA disk arrays. And this week, Sun will announce that it has doubled that number, selling 2,000T bytes of FC-AL storage for its Solaris servers during the past three years.

Analysts said the market momentum will be behind FC-AL, mainly because IBM is currently the only SSA vendor.

"Fibre Channel is dramatically faster than SCSI," said Andrew Prophet, president of Andrew Prophet Research & Consulting in San Jose, Calif.

"And Fibre Channel vendors seem to be driving their costs down a lot faster than people expected, so there could be some price reductions for users."

## PHOTON SYSTEM

Sun will release its second-generation FC-AL storage systems, code-named Photon, this summer and add support for Windows NT and Hewlett-Packard Co.'s HP 9000 servers by year's end.

And IBM will keep bolstering SSA to secure the investments many users have already made and attract its huge base of RS/6000 server customers to new storage products.

Last month, IBM began testing an SSA 160 chip that will double SSA speeds by next year. IBM also offers an interface card that lets HP and Sun Unix servers access SSA disk systems without requiring the servers to have SSA adapters or controllers. □

# Video, graphics drive up storage requirements

By Matt Hamblen

DURING the past decade, computer storage capacity has mushroomed along with the number — and size — of applications.

Storage engineers are cramming more bits per square inch on storage media, while the cost per megabyte has plummeted from hundreds of dollars to pennies.

Inexpensive storage lets users download huge files from the World Wide Web and store electronic mail on desktop or laptop hard drives. When graphic artists need more storage space, they simply use a removable hard drive from companies such as Imagem Corp. in Roy, Utah.

The increased use of graphics and video has caused digital storage to grow tremendously. "Anything in video is causing storage to grow," said Dennis Waid, president of Peripheral Research Corp. in Santa Barbara, Calif.

## DIGITAL CITY MAPS

Stored digital video and graphics are in their infancy, Waid said. Hotels are beginning to offer guests city maps or views of plays and other entertainment around town. The data is stored on a server and streamed to guests' televisions or a lobby kiosk.

Storage needs will grow if "push" technology takes off,

bringing large video and graphics files from the Web to desktops, one user said.

"It doesn't take a stretch to imagine the large impact on storage if something is pushed to you and you don't want to look at it right away, so you store it somewhere," said Eric Haseltine, vice president and chief scientist for creative technology at Walt Disney Imagineering in Glendale, Calif.

Phil Devin, chief storage analyst at Dataquest in San Jose, Calif., said the typical sales presentation often carried on a laptop computer with graphics-rich presentation programs, has grown from 200K bytes to 200M bytes during the past few years.

## GET READY FOR VIDEO MAIL

Several analysts and Haseltine said the advent of successful desktop videoconferencing in office settings is bound to spur video mail. When that happens, information systems departments must be ready for increased storage requirements as users store enormous video-mail files, rather than view them and throw them out, analysts said.

"The price of storage is dropping so fast that people can afford it, so it's becoming easier to save all sorts of files rather than throw them out," said Currie Munce, director of data storage research and advanced technol-

## SIZING UP DIGITAL FILES

Type	Size
40 pages of text	100K bytes
1 hour of digital music	500M bytes
1 hour of digital video	2.2G bytes
1 hour of high-definition video*	6.7G bytes

Source: Peripheral Research Corp., Santa Barbara, Calif.

ogy at IBM's Almaden Storage Research Facility in San Jose.

The sheer size of video files can be hard to comprehend, analysts said. An hour of digital video saps 2.2G bytes of space — about two times as much digital space as one hour's reading time of digital text, according to a report by Peripheral Research.

Digital video images gobble up storage in this way: One tiny

color pixel, smaller than the size of a period, may take up to four bytes in size; one frame on a high-resolution video screen could be 1M byte; and one second of high-quality digital video contains 30 frames.

That doesn't include the memory needed for digital sound, video running in multiple windows or video that require interaction, analysts said. □

## NEW PRODUCTS

**TECMAR TECHNOLOGIES, INC.** has announced a 200G-byte, eight-cartridge magazine-based digital audio tape auto-loader, the WangDAT 3900 LD8. According to the Longmont, Colo., company, the auto-loader uses 4mm digital audio tapes in a 5.25-inch format. It costs \$4,900. **Tecmar Technologies** (303) 702-7015 [www.tecmar.com](http://www.tecmar.com)

**PROXIMA CORP.** has announced a version of its Lightbook ultraportable notebook projector that supports VGA and Super VGA resolutions.

According to the San Diego company, the 11-pound projector is small enough to fit inside an attache case.

It costs \$5,999. **Proxima Corp.** (619) 457-5500

# Separated at birth?



The hard-selling but always approachable Phil White of Informix...

and Sun's don't-approach-'til-he's-had-his-jolt-of-Java technologist, Greg Papadopoulos?

## Informix & Sun

Sun and Informix. We've been together so many years, you'd swear we were related. In fact, thousands of companies have purchased Informix products on Sun<sup>®</sup> systems. And we've linked our engineering, service and support teams to deliver leading performance and customer satisfaction. And now that Informix has adopted Java<sup>™</sup> across its entire product line, you'll be able to manage and use information in new and innovative ways. Just another example of how we're working together to offer your business true mission-critical solutions. Not just promises. But then that's what true alliances are all about. To find out more, contact us at [www.sun.com/sepcw](http://www.sun.com/sepcw) or [www.informix.com](http://www.informix.com). **THE NETWORK IS THE COMPUTER<sup>™</sup>**

 **INFORMIX<sup>®</sup>**

 **Sun**  
microsystems

# Smart cards may aid the network PC

CONTINUED FROM PAGE 43

that users carry with them on the job, analysts said.

And although smart-card readers and wide-scale access to network computers for multiple users aren't available, the technology could have many uses, observers said and some early users said.

Smart cards would let end users log on to machines quickly and gain access to applications they use — regardless of the machine's location.

The technology also would be useful in areas such as health care and customer service jobs across multiple industries, according to Ira Morrow, an analyst at Gartner Group, Inc. in Stamford, Conn.

Customer service workers, for example, typically access the same few applications repeatedly.

**Smart cards would let end users log on to machines quickly and gain access to applications they use — regardless of the machine's location.**

ly. Health care workers need access to machines in a variety of locations throughout a hospital and need a secure environment because the data they access is usually private patient information, Morrow said.

#### ABOUT THE FRAMEWORK

The OpenCard Framework is enabling technology that lets end users download device drivers from the Internet to allow communication with multiple smart-card types.

Smart cards store a cardholder's personal information in a secure, silicon-based chip. After inserting a smart card into a reading device, which can be attached to a network computer or a PC, a personal identification number is used to identify and authenticate the cardholder.

By using a secured connection such as the Internet or a dial-up direct connection to a corporate server, an end user

could access applications, electronic mail or other data on the network they now access remotely with a laptop.

But according to Neil McDonald, an analyst at Gartner, those types of applications for mobile network computer users are probably at least two years away, assuming that network computer appliances will become like public telephones — available at hotels, airports and other destination stopovers.

#### SMART CARDS ON CAMPUS

Some smart-card technology is already here.

More than 38,000 end users at Florida State University in Tallahassee — students, staff and faculty — have used smart-card technology for several years based on a system the university developed using components from a handful of vendors.

The university recently joined with CyberMark in Columbus, Ohio, to market the university's smart-card system, said Chris Corum, a marketing director at CyberMark who was a program manager at Florida State until two weeks ago.

The university's population uses smart cards for access to library books and student records and will use them to access campus computer labs, Corum said.

"For many students here, the cards are second nature because they've been using them since they arrived," he said.

Cirium said local vendor such as bookstores can download cash electronically from the cards — which students have used at unattended machines that resemble automated teller machines.

Although those students aren't mobile office workers, some of their needs are the same; both groups need to access information and conduct transactions in a secure way.

"[Students] will carry the [smart-card] concept with them as they enter the workplace," Corum said. He said CyberMark and the university are just steps away from providing students online access to the types of applications they need — and will offer it to them as soon as a firewall is completed and scripting is done for applications. □

## SYSTEMS INTEGRATION

# R/3 finds a home with NCR, DG

By Randy Weston

SAP AG's R/3 software system is getting a prefabricated home on NCR Corp. and Data General Corp. servers.

NCR and DG recently made separate integration deals intended to strengthen R/3's reliability on clustered Windows NT servers.

Dayton, Ohio-based NCR is working with SAP to integrate R/3 with NCR's LifeKeeper middleware and Informix Software, Inc.'s Online Dynamic Server database on NCR's WorldMark server platform running Windows NT.

An NCR spokesman said the company also is testing a package for Oracle Corp.'s database server.

DG, in Westboro, Mass., is releasing a prepackaged cluster system designed for R/3. It includes DG's low-end Avion servers, a fault-tolerant Clarion RAID storage system and the NTA/Alert automated problem detection system with Veritas Software Corp.'s fail-over software FirstWatch for NT.

Henry Morris, an analyst at International Data Corp. in

## NT CLUSTERING PACKAGES FOR R/3

Company	Product	Prices
NCR	Two WorldMark 4300 servers each running Informix or Oracle database software, LifeKeeper middleware and NCR's NetVault	Starts at \$500,000
Data General	Two low-end 200-MHz Pentium-based Avion servers, Clarion disk arrays, NTA/Alert and FirstWatch	Starts at \$75,000

Framingham, Mass., said companies "are increasingly relying on applications like R/3 to run their businesses," and "system availability is becoming a critical issue."

He said the key component of the NCR and DG systems is the fail-over software. It is used to switch from a failing server to a working one to keep the R/3 applications from going down because NT isn't as robust as Unix.

Those systems are meant to protect companies from unplanned downtime, but Morris said users also need to plan for scheduled downtime, such as when upgrading the R/3 software.

"SAP requires you take the system down for up to 10 hours or more," Morris said. "Organizations need some overall plan for high availability at the time they are making their R/3 purchase or when they are making their re-engineering plans around the system."

Such plans include developing a policy for handling the downtime, such as doing the work only on weekends or developing a backup system for mission-critical applications within R/3. □

# Microsoft upgrades Windows CE operating system

CONTINUED FROM PAGE 43

does said the Windows CE devices are selling briskly. But hard numbers on Windows CE sales haven't been released yet.

Stephen McCallister, information systems manager at Planned Parenthood of Western Washington in Seattle, is testing Casio Computer Co.'s Cassiopeia and Compaq Computer Corp.'s PC Companion.

"I really like the size," McCallister said. "[They fit] right in my coat pocket. And as a keyboard junkie, I like the little keyboards."

But even as industry observers predicted that the Windows CE devices and electronic organizers such as U.S. Robotics Corp.'s PalmPilot will wake up the moribund PDA market, they also said IS managers are becoming more concerned about support issues.

"The vendors and software developers need to be aware that IS is worried about remotely managing these systems," said Diana Hwang, an analyst at International Data Corp. in Framingham, Mass.

Hwang said there are few corporate rollouts of Windows CE handhelds or PDAs. Rather, individual users are buying the systems and using them to receive and send electronic mail and maintain client lists.

#### SECURITY ISSUES

That unpredictable purchasing pattern brings up security issues, industry observers said.

Leslie Fiering, an analyst at Gartner Group, Inc. in Stamford, Conn., said data and hardware security issues are even more important with PDAs than with laptops.

"With the palmtops, they are much easier to lose or leave behind," Fiering said. "And if the user buys the device himself, then who owns the data? The power of these palmtops has

International Data Corp. in Framingham, Mass., predicts 300,000 Windows CE devices will sell this year.

reached the point where a salesperson can keep their entire contact list on them."

In the meantime, vendors are planning the following steps to aid IS in supporting the systems:

- U.S. Robotics is developing support tools for PalmPilot, including updating its Palm operating system to let developers create applications using Microsoft's Visual C++. Recently, U.S. Robotics offered TCP/IP support and the ability to remotely synchronize data via the Internet or LANs.

- Compaq plans to extend its Intelligent Manageability software to its Windows CE device, the PC Companion. That will let IS managers track a device's software by creating a special set of agents.

- Puma Technology, Inc. in San Jose, Calif., last week announced it is offering data synchronization with its IntelliSync software and Symantec Corp.'s ACT contact management software for PalmPilot and Windows CE devices. □

# Separated at birth?



Serious pool shark Dave Duffield  
of PeopleSoft...



and seriously handicapped golfer  
John Shoemaker of Sun?

## PeopleSoft & Sun

Sun and PeopleSoft. Together we provide solutions that scale across the entire enterprise. Solutions that deliver the performance and reliability modern business demands. Jointly, we are committed to delivering universal access to business information worldwide, whether it be through an intranet, extranet, or on the Internet. All with a level of quality that's winning over customers around the globe, from recently merged healthcare organizations to the largest retailers in the world. In short, it's the sort of alliance that gives you not just technology, but superior answers to business challenges. To find out more about what we can do for your organization, contact Sun at [www.sun.com/sepcw](http://www.sun.com/sepcw) or PeopleSoft at [www.peoplesoft.com](http://www.peoplesoft.com) or 888-PSFT-APPS. **THE NETWORK IS THE COMPUTER™**

PEOPLE  
Soft

Sun  
microsystems

©1997 Sun Microsystems, Inc. All rights reserved. Sun, Sun Microsystems, the Sun logo, and The Network Is The Computer are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States and other countries. PeopleSoft and the PeopleSoft logo are registered trademarks of PeopleSoft, Inc. "Separated at birth" is a registered trademark of SPY Magazine.

EASTMAN KODAK COMPANY INTRODUCES

# Eastman Software

A Kodak Company

**Eastman Kodak Company  
just improved the outlook of  
document imaging and enterprise  
work management.**

Through the acquisition of Wang Software, Kodak has expanded its product portfolio to include industry-leading technology for imaging, workflow and COLD, as well as document and storage management.

Now your organization can leverage our powerful solutions to manage critical business information and processes - from document capture and workflow management through document warehousing and retrieval.

To learn more about our expanded portfolio of software products, visit [www.eastmansoftware.com](http://www.eastmansoftware.com)

Or call us at 1-800-243-8811.



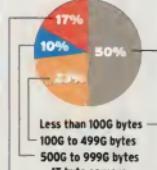
# Software

Client/Server • Development • Operating Systems

## Briefs

### HOUSE BUILDERS

How much data do you expect to store in your data warehouse in the next 18 months?



Base: 1,000 attendees surveyed at Digital Consulting, Inc.'s Data Warehouse Conference in February

Source: Meta Group, Inc., Stamford, Conn.

### New Pablo OLAP

Andyne Computing Ltd. in Kingston, Ontario, has announced a new version of its Pablo online analytical processing software. Pablo 4.0 includes a CubeCreator feature that automatically generates multidimensional analysis "cubes" from transaction data. Support for exporting data to World Wide Web browsers is being added. It costs \$695 per user and is due to ship later this month.

### Oracle for mobile PCs

Oracle Corp. last week introduced a release of its lightweight database for mobile PCs. Version 2.4 of Personal Oracle Lite integrates Oracle's Mobile Agents middleware to provide wireless connectivity, which frees users from having to plug in modem lines to replicate data between their laptops and corporate database servers. It costs \$195 per user and is due to ship in May.

### Tool for MQSeries

Next week, Precise Software Solutions in Braintree, Mass., will begin beta-testing a tool to simplify the creation of applications that use MQSeries middleware. Called Q/booster, the tool provides an easy interface to MQSeries' secure data messaging services, which speeds up development. Q/booster will be available in June starting at \$25,000.

## Sears Canada catalogs gains

By Craig Stedman

WHEN SEARS, Roebuck and Co. threw in the towel on its faltering catalog business five years ago, its Canadian affiliate didn't have the same luxury, despite similar revenue declines and losses.

Two-thirds of Sears Canada, Inc.'s customers still make some or all of their purchases through its catalogs, rendering a mail-order phenom unpalatable in the Great White North. But the Canadian Sears was being pummeled by the same competition from discount retailers and specialty catalogs that killed the U.S. operation. And its mainframe-based cata-

log marketing system was straight out of the retailing Stone Age.

Customers who didn't buy anything for a year were excised from Sears Canada's database. The company's marketers couldn't find out what people bought from its different catalogs. A query on sales of Levi's jeans had to be set up to collect data going forward, rather than getting an instant look at recent history.

"It was like a black box that we couldn't see into," said Fred Hagerman, customer list manager at Sears Canada's catalog division in Toronto. That contributed to an annual routine of losses and reductions in catalog



**Sears Canada's Fred Hagerman (left, with Bruce Clarkson):**  
Catalogs can now be targeted at customers "who weren't shopping with us anymore. Before, we would have just kept ignoring them."

revenue and active customers, and lower pricing. And it flipped the switch on a Unix-based customer analysis system that is meant to match the sophisticated technology used by U.S.-

Sears Canada, page 52

## IBM succumbs to millennium mania

► Year 2000 package aimed at mainframe fixes

By Sharon Gaudin

IBM IS THROWING its hat into the year 2000 ring, but some users say they may not want the help.

IBM will release a package of tools and services this month to

help its many users tackle the year 2000 problem on their mainframes. This package, named Visual Age for the Year 2000, includes a Visual Age for Cobol tool, code analyzer tools from third-party vendors and support services.

The tools, which could be used individually for other projects, are meant to work together on year 2000 projects. Used together, the tools are designed to search through an application to automatically find and fix errant Cobol code in mainframe applications. IBM executives said the company is developing a separate tool for C and C++ applications.

But Kalman Shor, assistant director of MIS at Michael Anthony Jewelers in New York, said he doesn't trust an automated tool. He wants his programmers to actually get their hands on the code and fix it themselves.

## FRANKLY SPEAKING

### Fine-tuning is too costly

FRANK HAYES

**T**ED NELSON, the man who invented hypertext, used to ask groups of programmers, "How many of you prefer to drive a stick shift?" As most of the hands in the room went up, Nelson would say, "None of you should be designing user interfaces."

His point was that stick-shift users are willing to do extra work so they'll have finer control and maybe get a little more efficiency out of their machines. Lots of programmers have that fine-tuning obsession, which can make life miserable for users who don't care about a million options but just want to get the job done.

Today, maybe those programmers in Nelson's audiences shouldn't be designing anything at all.

It's ugly but true: Corporate IS shops can no longer afford stick-shift programmers. We

can't afford coders who want to optimize tight loops, make calls to assembly-language routines and take advantage of undocumented features.

In other words, we can no longer afford to do the stuff that's really fun.

Make no mistake: I like assembly language, along with everything else in the codemaster's bag of tricks. A computer is the best electric train set in the world, and I've never gotten tired of making all the bells and whistles work.

But IS shops today just plain can't afford that anymore.

We can't afford it because hardware has become too cheap, and technology is changing too fast, and the backlog has gotten too big to make clever coding worthwhile. It's faster and cheaper to upgrade hardware than to devise and maintain Hayes, page 52

Here's what's included in IBM's Visual Age for Year 2000 package:

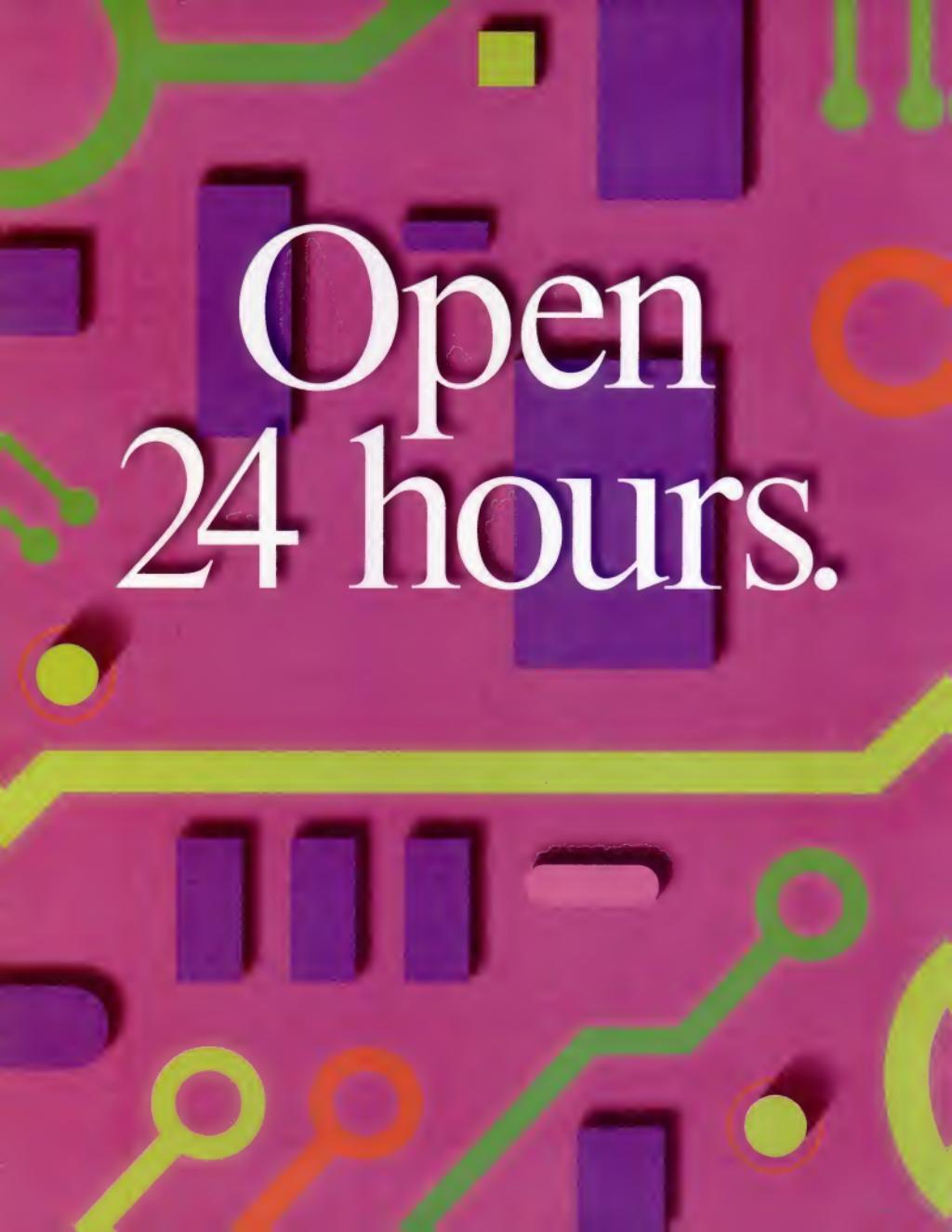
■ Visual Age for Cobol Version 1.2 for OS/2 Professional Edition for Workstations

■ Isgon's SoftAudit/2000 and SoftAudit/ONE package, which analyzes the code

■ Edge Software's Portfolio Analyzer

■ Support services

IBM, page 52



Open  
24 hours.



Unfortunately, it is not always what you can expect. That's why more and more organizations, both large and small, are choosing scalable, dependable Standard High Volume (SHV) servers based on Intel architecture processors like the Pentium® Pro processor.

SHV servers span entry-level through mid-range applications, including a broad base of commercial, off-the-shelf software based on Windows NT® and UnixWare®.

These systems give you the performance headroom you need today, and the ability to scale that performance as your business needs grow. And they're available from many quality systems suppliers.

What's more, SHV servers running some of the most popular management software help keep your information system up and running, while keeping your total cost of ownership exactly where it belongs—down. To learn more about SHV servers, visit Intel's Web site at [www.intel.com/SHV/servers](http://www.intel.com/SHV/servers)

# 32-bit applications gain ground

By Kristi Essick

PC USERS last year bought \$10 billion worth of application software in the U.S. and Canada — an 8.3% increase from 1995 figures, according to new research released by the Software Publishers Association (SPA).

After a slip in the third quarter last year, application software sales were up to \$3.4 billion in the fourth quarter, 28% more than the similar period in 1995.

Unit sales of packaged software increased 27% in North America last year and were up 42% in the fourth quarter last year, compared with the similar period in 1995.

Unit sales of packaged software increased 27% in North America last year and were up 42% in the fourth quarter last year, compared with the similar period in 1995.

## MICROSOFT, OF COURSE

Microsoft Corp. Windows-based applications accounted for 81% of the application software sold in the U.S. and Canada last year, with sales of \$8.5 billion — an increase of 16.3% from the previous year.

The SPA forecasts that sales of 32-bit applications will surpass 16-bit sales by the middle of next year, according to the report. In the fourth quarter last

year, 32-bit Windows applications accounted for 48% of Windows application sales; 16-bit applications accounted for 52%.

Things weren't as rosy for Macintosh-based application sales, which last year fell 23%, to \$1.2 billion, compared with 1995 figures.

On the whole, Macintosh sales represented just 11% of the application software market last year, the report said. And fourth-quarter Macintosh application shipment fell 30%, to \$33.6 million, compared with the similar period in 1995.

DOS applications continued to dive, with last year's sales falling 46.4%, to \$58 million. In the year's final quarter, DOS sales declined 60%, to \$11.8 million, from 1995's fourth quarter.

The applications that showed the strongest growth last year were electronic-mail products and Internet development tools, according to the SPA.

Collectively known as "other productivity" applications, this group grew 42.5% last year compared with 1995, selling \$2.3 billion worth of products. Database software sales also

saw healthy growth of 27.7% last year, with Macintosh database applications growing much faster than Windows-based databases, the only category in which Macintosh beat Windows.

Macintosh database sales grew 65.5%, and Windows database sales grew 26.9%. The 46.3% drop in DOS database sales caused the overall figure to fall to 27.7%.

Software applications that saw a decrease in sales last year include drawing and painting applications, which fell 25.6%, to \$143 million, and other graphics software, which fell 12.3%, to \$275 million.

## DISAPPEARING DOS

But sales of presentation graphics software grew 18.6% last year. Sales of word processing software fell 10%, to \$976 million. Macintosh word processors experienced a 31.7% drop in sales, and DOS word processors nearly disappeared after sales fell off 91.8%.

The SPA, which is based in Washington, is an industry group that represents 1,200 software companies worldwide. □

Essick writes for the IDG News Service in London.

# IBM addresses 2000

CONTINUED FROM PAGE 49

"These tools just aren't practical," Shor said.

He said he has been briefed on the tool package but won't be buying it. "Say you get an 80% hit with an automated tool, you still have 20% to do by hand. No automated tool will give you 100%," Shor said.

He also said it takes as much or more time to clean up that 20% than it would to do it all manually.

"It takes a lot of time to examine what the tool did and then go through the code to find that 20%. It's better to go through it by brute force. It's cheaper for us to rent programmers to handle this," he noted.

The year 2000 problem results from computer applications that recognize only the last two digits of the year in date structures.

That will cause crashes and other problems in date-sensitive applications at the turn of the millennium.

To avoid the problem, corporate IS managers have been searching for the easiest way to tackle what often is a gargantuan problem. And vendors have been quick to jump in to what could be a lucrative market — solving this problem.

The information systems

manager at one of the country's largest banks said his company has been weighing the problem for the past year, and he's not convinced that a tool is the answer.

## SEE ME IN 2999

"None of these vendors really know how to handle this because we've never gone through it before," said the IS manager, who asked to go unnamed. "Let them come to me right before the year 2000 and tell me how they fixed the year 2000. Then I'll look at their tools."

The manager said he shares Shor's concerns about automated tools. "I'm more comfortable when someone actually looks at the code," he said. "That's my data they're messing around with."

The tools in IBM's Visual Age for the Year 2000 package will be available in April.

Visual Age for Cobol 1.2 for OS/2 Professional Edition for Workstations has a list price of \$1,899. The host costs \$5,500.

Isogen Corp.'s SoftAudit/2000 and SoftAudit/ONE package, which analyzes the code, is listed at \$27,900.

Also part of the package, Edge Software's Portfolio Analyzer for the host costs \$19,000. □

# Hayes

CONTINUED FROM PAGE 49

clever hacks to the code.

We also can't afford it because those clever programming tricks are costing us — a lot.

For example, the year 2000 problem was caused by a clever hack: using just the last two digits of the year. At the time, it saved some expensive storage space and processing time. But today, storage and CPU time are cheap — and fixing the year 2000 problem will cost a trillion dollars.

## NIGHTMARE CODE

15 shops across the country have plenty of legacy mainframe applications that have been patched, spliced or adjusted with clever hacks that also served to make them maintenance nightmares. Even more recent programs built with Visual Basic and PowerBuilder use tricks and undocumented features that mean they can't make the jump when Microsoft or Sybase upgrade the development environment.

We can't afford to keep digging ourselves into this hole. It's time to let go of that stick shift.

Developers have to start being more than just coders. That means using visual tools that automatically generate code, and — don't touch! — hand-optimizing the code once it's generated.

Project managers have to start investing in those tools and making sure developers spend their time solving business problems and making easy-to-use interfaces, not tweaking tight loops.

And IS executives have to start budgeting money for that bargain-priced hardware to get big performance improvements, instead of hoping that clever programming tricks will squeeze out a little more speed.

Will those new tools make working in corporate IS less fun?

Maybe, but the alternative is having competitors eat your lunch because your IS shop has become a cost center instead of a competitive edge.

Either you quit shifting gears by hand today, or tomorrow you may not have anything to shift with. □

Hayes is Computerworld's staff columnist. His Internet address is [frank\\_hayes@cw.com](mailto:frank_hayes@cw.com).

# Sears Canada catalogs gains

CONTINUED FROM PAGE 49

based clothing catalogs and retailers such as Wal-Mart Stores, Inc. in Bentonville, Ark.

The new system, called Prophet, combines IBM's RS/6000 Unix server and DB2 database with custom-built catalog management software and Archer, a retail analysis tool made by Retail Target Marketing Systems, Inc. in Waukesha, Wis.

## BETTER TRACKING

End users can analyze sales data summarized in DB2 with Archer and then import the results into spreadsheets to predict and track catalog performance. Data from 1994 to the present is now available, and the company plans to keep five years' worth of transactions on hand for analysis.

Now, Sears Canada "can start to query deeper into customer behavior," which allows more targeted catalog mailings aimed at reducing costs and maximizing profits, Hagerman said.

It also can identify customers who are wavering in their purchases and put together marketing campaigns to keep them in the fold.

Sears Canada and other older-line Canadian retailers face the same competitive pressures as their U.S. counterparts, said Richard Talbot, managing director at Thomas Consultants International, Inc. in Toronto.

The top three Canadian retailers' share of retail sales eroded from 70% to 50% in recent years, due largely to incursions by Wal-Mart, he said. One of the three, Eaton's, was forced to seek bankruptcy protection in March.

One shortcoming is that old-line retailers and catalog merchants typically have been "shooting in the dark with a shotgun approach" on marketing, Talbot said.

Now, companies are scrambling to catch up with their more technology-savvy rivals, he added.

Sears Canada was losing 5% of its catalog customer base each year, even when it purchased external mailing lists to target new buyers, said Bruce Clarkson, national manager of customer development at the catalog division.

Since last June, that has turned around and is projected to grow 5% this year.

**Sears Canada said its catalog business accounted for more than 10% of last year's revenue of \$4 billion (\$2.9 billion U.S.).**

A women's clothing catalog that was sent to lapsed buyers in January is expected to turn a profit, and similar mailings are planned for other products this summer. Sears Canada hopes total catalog merchandise sales will return to the black this year, Clarkson said. □

The good news about our Web-deployable software is that you can set up an office anywhere.



(The bad news is, we mean anywhere.)

LAWSON INSIGHT™

## Business Management System makes

networking new locations and remote or mobile employees as

simple as adding browser software. End users will have instantaneous access.

to our world-class financials, human resources, procurement and supply chain processes.

suites without sacrificing functionality. And, for the first time, Mac and PC workstations can access the same

databases. All this, at a fraction of the cost of maintaining a wide-area network. And our open licensing policy lets you migrate.

through future technological changes and upgrades without additional licensing fees. **LAWSON INSIGHT. Because the future can't wait.**

# GOT DESKTOP ANTI-VIRUS? NOW YOU'RE ONLY 50% EXPOSED.



## Introducing McAfee Desktop Security Suite. The first total desktop protection all in one box.

Even the best anti-virus still leaves you vulnerable to attack. Last year nearly two-thirds of all companies reported losses of \$50,000 or more from security breaches. Eighteen percent had losses of one million dollars or more.

It's a big problem, especially since desktop threats are as varied as they are expensive.

Over 200 new viruses appear each month.

Outside hackers are becoming more skilled at gaining access. According to the FBI, your own employees are responsible for 50% of all network intrusions. And disasters such as system crashes are completely unpredictable.

But now you can protect against all desktop threats with the

new McAfee Desktop Security Suite—the first desktop security solution to give you total protection in one suite.



solutions for complete desktop protection.

Our anti-virus products are the world's most popular and effective, consistently detecting 100% of all known viruses.

Desktop encryption scrambles any file with unbreakable 160-bit encryption. And network encryption instantly encrypts and de-encrypts all TCP/IP traffic. Without any change to your applications or training for your users.

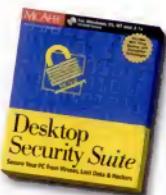
Desktop firewall transparently guards against unauthorized access—like open modem lines that are a backdoor to your net.

And backup automatically backs up files to any Jaz™ or tape drive. To restore files, simply drag-and-drop.

**Buy VirusScan, and get 50% off  
when you upgrade to Desktop Security Suite.**

If you already own VirusScan, great. If not, get it immediately—with 100% virus detection, it's the best protection you can buy. And when you're ready to upgrade to Desktop Security Suite, we'll give our corporate customers 50% off the list price.

After all, if you provide complete protection against financial loss, we think you should enjoy some financial gain. For more information on Desktop Security Suite, call McAfee at 1-800-332-9966, Dept. 311.



**MCAFEE**  
Network Security & Management

### McAfee Enterprise – Mod

Network Security	Network Management
Desktop Security Suite	Gateway Security Suite
Server LAN Workstation	McAfee Service Desk

McAfee security products are part of McAfee Enterprise, a fully integrated NT-centric systems management solution.

Download McAfee

[www.mcafee.com](http://www.mcafee.com)

[ftp.mcafee.com](http://ftp.mcafee.com)

885: (408)988-4004

America Online: MCAFEE

CompuServe: 60 MCAFEE

Telephone (408)988-5832 Fax (408)970-9727 © McAfee Associates, Inc., 1997. All rights reserved. All brands and products are trademarks of their respective holders.

# The Enterprise Network

LANs • WANs • Network Management

## Briefs

### NT/host access

IBM last week shipped its Communications Server for Windows NT. The server provides Windows NT users with access to IBM 3270 host computer applications or databases via their World Wide Web browsers by using familiar Windows NT commands. The add-on software costs \$995 per server and \$69 per user workstation. Customers can get a free evaluation kit at [www.networking.ibm.co/csn/csnprod.html](http://www.networking.ibm.co/csn/csnprod.html).

### Cisco aims at ISDN...

Cisco Systems, Inc. in San Jose, Calif., recently announced plans for an add-on card that will enable systems in carrier switching offices to provide Integrated Services Digital Network (ISDN) Integrated Digital Subscriber Line service. The service will let carriers provide businesses and residences with at least 128K bit/sec. of bandwidth over existing copper lines without the many hassles associated with ISDN lines. The Cisco 901 channel unit costs \$995 and requires no changes to carrier switching systems.

### ...and high-end gear.

Cisco also confirmed plans to announce in the coming months the long-awaited Gigabit Switch/Router (CSR) line, a super high-end router family that could let Internet service providers and carriers eliminate bandwidth bottlenecks. The CSR can be equipped with 155M and 622M bit/sec. Asynchronous Transfer Mode interfaces.

### HP turns to SMS

Hewlett-Packard Co. has significantly expanded the scope of its enterprise asset-management software. HP AssetView 2.2 offers a link to Microsoft Corp.'s System Management Server (SMS), which lets PC configuration information gathered by SMS transfer directly into the AssetView database. With the software, managers can build more complete reports about installed systems.

## Hospital goes for Gigabit

Lowell General Hospital's Edward Bianco said he feels more comfortable with Ethernet-based technology



## Tools aim at Windows migration

By Patrick Dryden

MANAGEMENT SOFTWARE vendors last week offered new tools designed to help users migrate thousands of networked PCs to the latest Microsoft Corp. operating systems.

Intel Corp. and newcomer MainControl, Inc. seek to reduce the labor, expertise and time needed to upgrade PCs to Windows 95 and Windows NT.

Both introduced distribution and scripting tools that automate much of the tedious process of installing a new operating system, resulting in lower overall cost and fewer

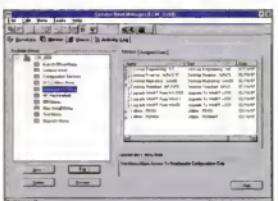
problems, according to beta testers.

"We can't synchronize the manual labor required to upgrade 10,000 desktops to Windows NT in the next five months," said Norbert Bueker, chief information officer at Bayrische Vereinsbank in Munich, Germany.

Instead of sending technicians to every desktop first for inventory and again for installation, the bank plans to save steps by using MC/EMPower from MainControl in Vienna, Va.

Centralized technicians will use inventory software to gather

Installation tools, page 56



Intel's LANDesk Configuration Manager can automate many steps required to install or update Windows across a LAN

► CIO says Gigabit Ethernet safe, robust

By Bob Wallace  
LOWELL, MASS.

EDWARD BIANCO determined that without a move to Gigabit Ethernet technology, Lowell General Hospital's LAN infrastructure would need serious medical help.

He isn't a doctor, but it didn't take the seasoned information technology executive long to diagnose that the weight of projects under way would crush the 200-bed hospital's network.

The busy information systems staff at Lowell General is rolling out a variety of medical imaging and desktop video applications and is completing an intranet fed by a fast-expanding object-enabled data warehouse.

"We have to use new technologies to facilitate the patient care process," said Bianco, chief information officer at Lowell General in Lowell, Mass. "But we must do so in a prudent way

Gigabit Ethernet, page 56

## GroupWise users on the fence over Novonyx

By Barb Cole-Gomolski

GROUPWISE USERS have mixed feelings about Novell, Inc.'s plans to form a separate company with Netscape Communications Corp. that will work to integrate Novell technology with Netscape's Internet servers.

S

Some said the effort will allow them to blend Internet hooks more quickly with their existing messaging networks. Others fear the effort could lead Novell to hand off some development to the new venture, which will be called Novonyx.

Truman Harsha is team leader of the network operations group at the U.S. Department of Agriculture in Fort Collins, Colo., which has several thousand GroupWise users. He said the move is somewhat troubling because, on the surface, it appears that Novonyx will have a role in the future development of GroupWise. Harsha said he doesn't want to see development

or technical support for GroupWise taken out of Novell's hands because he likes the development

GroupWise, page 56

Will GroupWise get hooked on Novonyx?

### Pros

■ Exposure for GroupWise in the Internet space through integration with SuiteSpot

■ Enhanced functionality (i.e., support for NNTP)

■ Widened distribution channel through Netscape ties

### Cons

■ Could change GroupWise's development path from the one users have bought in to

■ Novonyx work could confuse buyers in the groupware space

## Snapshot

SIGN IN, PLEASE

Worldwide market share estimates for remote access systems

System	1995 Market share	2000 Market share
Access routers	55%	40%
Access servers	25%	17%
Access concentrators	20%	43%

Source: Dataquest, San Jose, Calif.

## Installation tools

CONTINUED FROM PAGE 55

information about each PC via the network. Then they will create one file that models responses for installation at each PC.

Despite vendor claims that this process can be fully automated, Bueker said the bank will separate the distribution and installation steps.

MC/EMpower can distribute small application upgrades automatically, Bueker said. But technicians will carry the operating system upgrade data to each LAN server for local delivery, because "you can blow up your network by sending too much data across it," he said.

## PORTABILITY

To avoid overloading a campus or wide-area network, Intel designed its LANDesk Configuration Manager as a portable server that technicians can move from one LAN to another during a migration.

Even so, LANDesk Configuration Manager reduces the number of staffers and time required and improves configuration quality through its scripting, according to Greg Shadoan, a network engineer at integrator ICI Computer Services, Inc. in Winston-Salem, Ore.

Shadoan said one day spent with LANDesk Configuration Manager can save him a week of work when he reconfigures training LANs with 100 PCs.

A savvy information technol-

ogy organization can benefit from such tools, even if automated software distribution isn't completely reliable, according to Brian Murphy, a senior analyst at The Yankee Group in Boston.

"Maybe 200 out of 5,000 PCs will still require manual intervention," Murphy said. "It's very difficult for central IT to scope out and deal with all the changes that users can make at their stations."

The downside of MC/EMpower is the risk of investing in a complex suite of inventory and distribution tools, said Alison Palmer, research analyst at Hurwitz Group, Inc. in Newton, Mass.

"We need to hear that operating system distribution tools actually worked for someone migrating a lot of stations," Palmer said.

MainControl provides six desktop management functions in MC/EMpower, including modules that track changes and provide links to accounting systems.

Pricing ranges from \$20 to \$150 per station, according to the modules selected.

Intel includes the inventory function from its LANDesk Management Suite with the configuration server and scripting system, so users won't require its tool kit. LANDesk Configuration Manager costs \$10,000. □

## SHORT

## Web-enabled server monitor

Symantec Corp. recently upgraded its Expose server manager to ease access via the Web. Web and support Windows NT-based Web servers. Expose 4.0, which costs \$695 per server, provides a console that can monitor diverse

network operating system domains. It lets managers check those servers from a browser by using prepared or customized reporting parameters. In addition to watching the Windows NT system supporting a Web server, Expose 4.0 can track the number of hits, bytes transferred and current connections.

## Gigabit Ethernet

CONTINUED FROM PAGE 55

to make us competitive with the larger hospitals in downtown Boston." Lowell is roughly 30 miles northwest of the Bay State's hospital mecca.

One key project involves putting all hospital policies and procedures on Lowell General's intranet.

"This will eventually let all units of the hospital have screen access to this critical information

rather than having people flip through page after page in manual after manual," said Linda Elliott, nursing information systems coordinator at Lowell General. "There will be a tremendous reduction in paper, which will streamline the patient care process. This is one huge benefit that we're all looking forward to."

## TOO TAXING

Bianco's concern is that the intranet and many other projects would be too taxing on the hospital's existing 100M bit/sec. Fast Ethernet fiber campus backbone. His options are to move to Asynchronous Transfer Mode (ATM), which scales from 155M to 622M bit/sec, or to fledgling Gigabit Ethernet technology.

which runs at 1G bit/sec.

Analysts said Gigabit Ethernet may cost slightly more than ATM, but it is difficult to put a price tag on the cost of retraining a networking staff to support a "new" technology such as ATM.

"ATM has been around longer than Gigabit Ethernet, but

ATM [specifications] are still all over the place," Bianco said.

"Ethernet technology is much safer and far more robust than ATM." Bianco's decision came down to his feeling more comfortable with Ethernet-based technology.

The CIO said he is aware that Gigabit Ethernet standards aren't likely to be set until mid-1998, but he said the hospital could implement the technology in six months anyway. "Every major vendor has a huge vested interest in Ethernet technology and will therefore make sure there's a solid standard that works," Bianco said. "Sure, individual vendors will have proprietary twists, but interoperability will be the goal."

The hospital is considering adding Cabletron Systems, Inc. Gigabit Ethernet modules to its Cabletron MMAC-Plus back-

bone switches.

With the many ongoing projects at Lowell General — chief of which is integrating hospital information systems — Bianco said the hospital didn't want to implement a different backbone technology. "We're migrating everything we can to NT and are having a hard time just recruiting people with strong NT experience. Installation time is a critical issue, and we decided it'd be a quicker and simpler cutover to Gigabit Ethernet than to ATM."

Lowell General's planned move to Gigabit Ethernet could mark a trend in the way the health care industry views advanced LAN technologies.

## BANDWIDTH HUNGER

"There's a lot of old technology being used in the health care industry, but that has to change as hospitals deploy some of the industry's most bandwidth-intensive applications, including medical imaging, teleradiology and desktop video," said Daniel Briere, president of TeleChoice, Inc., a consultancy in Verona, N.J. "Hospitals want to eventually extend computer systems to the bedside, although that can't be done without a robust network infrastructure." □

## GroupWise users

CONTINUED FROM PAGE 55

ment path Novell has set out for GroupWise and fears the new entity will change directions or slow that growth.

But Jim Shaw, senior account manager at CompuNet Services, Inc., a systems integrator in Burbank, Calif., disagreed. "The result [of Novonyx] will be the SuiteSpot servers on IntranetWare, which is neat," Shaw said. The Novonyx work could also boost GroupWise with support for Netscape-supported proto-

cols, including Internet Message Access Protocol and Network News Transport Protocol (NNTP), Shaw added.

Novell announced plans last month to set up the privately held company with Netscape, but details are still sketchy. Novell officials said Novonyx will be in the Provo, Utah, area and will operate independently from its parent companies.

## SUITE MOVE

The new company's primary charter is to port Netscape's SuiteSpot family of Internet servers to Novell's IntranetWare. Netscape's servers currently run on Microsoft Corp. Windows NT and Unix.

At the same time, Novell will provide the spin-off with the right to resell GroupWise and Novell Directory Services (NDS), which the company will integrate with Netscape's offer-

ings. Down the road, Novonyx could integrate GroupWise with components of SuiteSpot for IntranetWare or license pieces of GroupWise to use within its own products, according to Eldon Greenwood, director of product management at Novell's applications division.

"The more GroupWise is integrated with Internet applications, the better it will be," said Ken Ainge, information systems manager at KTVX-TV in Salt Lake City, a GroupWise shop.

Analysts were quick to point out, however, that Novell appears to be risking losing GroupWise sales for the sake of its flagship NetWare. Once SuiteSpot for IntranetWare is available, Novell will no longer be able to position GroupWise as the only groupware system with ties to NDS.

"This could be a case of conceding the groupware sale in order to get the NetWare sale," said Ian Campbell, an analyst at International Data Corp. in Birmingham, Mass. □

When will her education  
be as technologically  
advanced as her toys?



**Technology. It's moving fast.** And our schools are falling behind. Why? Lack of funds. Lack of resources. Lack of expertise. That's where your company comes in. By supporting Tech Corps. A grassroots effort to enhance teaching and learning through technology. And give students the advantage they need to get ahead in the game of life. Discover the rewards of becoming a Tech Corps Corporate Sponsor. 508/620-7751 • <http://www.ustc.org>  
**America needs to know.**



Organizations already providing national sponsorship include: Cellular Telecommunications Industry Association Foundation (CTIA), Digital Equipment Corporation, and MCI Foundation



**MMX™ Technology:** The Compaq Deskpro line is now available with Pentium® processors with MMX™ technology, which offer additional performance and functionality with your multi-media and communication-based applications.



**Memory:** RAM famished? You'll find it amply provided in a Compaq Deskpro. There's up to 64 MB EDO standard memory, expandable to 256 MB. Additionally, in a secondary cache, there's either 256 K or 512 K that gives you faster access to your data.



**Maximized Storage:** Did we hear someone say storage? How does 120 MB of floppy storage sound? Compaq was the first PC maker to offer the LS-120 Drive. With it you get increased data storage and faster transfer rates. And as an added bonus, it's backwards compatible to current 1.44 MB diskettes.



**SMART Hard Drives:** Another aspect of Intelligent Manageability that we innovated is our SMART Hard Drive technology. It helps prevent catastrophic data loss. Fire insurance is one thing. This is the best kind of all. Prevention.

# HOOAH vers

*(OR, A GUIDE FOR SPOTTING THE DIFFERENCES BE*



**Inherent Value:** What distinguishes the Compaq Deskpro line is its overall value. Everything from Asset Management and Info Messenger to LS-120 Drives and SMART Hard Drives to the quality and reliability. Ultimately, you get a lower cost of ownership over your desktop's lifecycle. Prices start at \$1,149\*.



**Technical Support:** You won't be left hanging. Because every Compaq Deskpro comes with what is possibly the most comprehensive technical support in the industry. It includes a dedicated 7x24 toll-free technical support number. Additionally, with each Compaq Deskpro you get a standard three-year limited warranty\* for parts and one-year on-site labor (with custom upgrades available too).



**Asset Management:** Asset Management is a part of the industry-standard technology that we pioneered called Intelligent Manageability (which supports the DMI standard). Asset Management lets you take inventory of all of your Compaq hardware and software from one location. No more time wasted running around. Time is, after all, money. And who has enough time? To say nothing of money.



access

**Information Access:** You'll find that the Compaq Web site offers the most extensive software support known to PC-kind. Or with InfoMessenger you can create your own profile and choose what technical information you want via the Internet. Just two of the ways that you will find Compaq gives you access to the information you need.



© 1997 Compaq Computer Corporation. All rights reserved. Compaq and Deskpro registered U.S. Patent and Trademark Office. Features vary by model. Some features available with Compaq Deskpro and independent software applications. Other features only available with Windows 95. The Intel Inside Logo and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. The PointCast Network is a trademark of PointCast Incorporated. Other products mentioned may be trademarks or registered trademarks of their respective companies. \*Price shown is estimated street price for entry level models. Dealer price may vary. Prices do not include monitors. (Certain restrictions and exclusions apply)



**Ease Of Integration:** Want compatibility? You've come to the right ad. Because all of our products are designed with an open architecture to ensure compatibility and integration into any network. Also our Insight Manager is compatible with top leading LAN management software now on the market, like Microsoft SMS, Intel LANDesk, Norton Administrator and others.



**PointCast™/Compaq Channel:** Selected Deskpro models include PointCast Network from Compaq, which will access the Compaq channel that provides an ongoing source of Compaq information. If you want to try it out, visit [www.compaq.com/us/pcn](http://www.compaq.com/us/pcn).



**Smart Cover Sensor:** If someone happens to get into your PC unexpectedly, you'll know about it, thanks to our Smart Cover Sensor. It's like having an invisible, full-time security force.



**Any Questions:** If you'd like any further information, please visit us at [www.compaq.com](http://www.compaq.com) or call 1-800-392-8883. A wannabe is fine in a trendy restaurant. But not on a desk.

# u s   S U B S T A N C E.

*TWEEN A DESKTOP WANNABE AND THE REAL DEAL.)*



**PD-CD Drives:** When you buy selected Compaq Deskpro computers, you get something a lot of desktop PCs don't have: PD-CD Drives. This gives you the option of reading current CDs or utilizing 650MB of rewritable storage. So when we say value, we put the technology where our mouth is.



*The Compaq Deskpro. Innovation, value and reliability. Just what you'd expect from the world's leading desktop.*



**Performance Monitors:** You'll find our P50, V70 and P70 monitors offer a super-fast refresh rate and flicker-free image. And since Compaq engineers designed them, they're as reliable as our CPUs.

**COMPAQ**

Has It Changed Your Life Yet?

# Take charge of your I.T. skills & training with this FREE tool

<http://careeragent.computerworld.com>

Use these FREE features at <http://careeragent.computerworld.com>

- Describe your current or ideal I.T. position
- Assess your skills
- See a personal "skill gap analysis" comparing your skills to the position you want
- Search for needed I.T. and business courses

And if you're an I.T. manager concerned about staff retention, you'll want to check out the "about Careeragent" button also at <http://careeragent.computerworld.com>. Here you'll see how a corporate subscription to CareerAgent will help your entire staff assess learning styles and skills, calculate skill gaps, and search for training. As a manager, you can use CareerAgent's intelligent decision support system to calculate individual, group and department skill gaps.

The point? Every individual on your team has an idea of their career plan, and knitting these plans together can benefit corporate goals. Think about your current team today. Do individual career plans in your organization seamlessly benefit from available projects? Training resources? Corporate goals? Is this information connected to cost-effectively reskill and retain staff? It's all possible with CareerAgent, where management and staff can collaborate to continuously develop a career "itinerary" for each individual. On the Internet or your intranet. Your choice.

For details, see <http://careeragent.computerworld.com> or call 1-800-343-6474, x6000 today. And make every career on your team what it should be: a well-planned journey of enrichment.

## Search Thousands of Course Listings From:

Learning Tree International

Wave Technologies

Hewlett-Packard Educational Services

Boston University Corporate Education Center

Interpersonal Technology Group

DPEC

Business Communication Review

American Research Group (ARG)

IKON

HOTT (Hands on Technology Transfer)

NIIT, Incorporated

The Center for Systems Management

New Horizons Computer Learning Center

Sybase/Powersoft Education

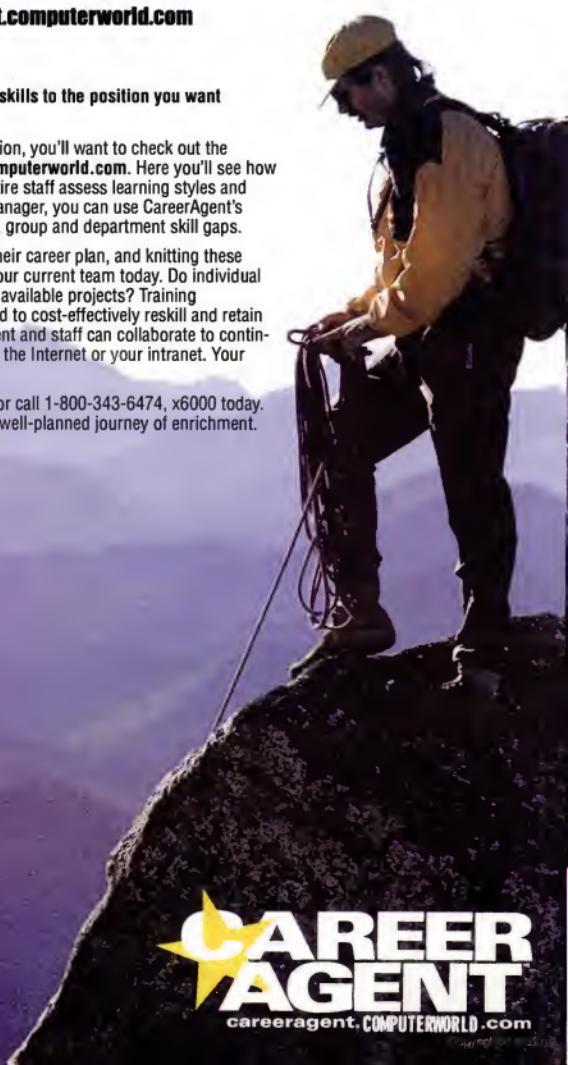
ESI International

The Seale Group, Inc.

And more coming soon...

New From:

**COMPUTERWORLD**



**CAREER  
AGENT**  
careeragent.computerworld.com

## NEW PRODUCTS

**BLUEWATER SYSTEMS, INC.** has announced Version 2.0 of WinDK, a device driver development kit that has a new device driver wizard. According to the Edmonds, Wash., company, the wizard can create hundreds of lines of driver code from specifications. It was designed for Windows NT with Microsoft's Visual C++.

Pricing starts at \$595.

**Bluewater Systems**

(206) 771-3610

[www.bluewatersystems.com](http://www.bluewatersystems.com)

**JAYCOR NETWORKS, INC.** has announced a Peripheral Component Interconnect (PCI) plug-and-play Fibre Channel adapter to its FireStart family of Fibre Channel cards and hubs.

According to the San Diego company, Windows NT and Solaris x86-based platforms with PCI bus compatibility can use Fibre Channel technology for faster transmission over wider distances. Adapters start at 1063M bit/sec. ability with copper interface and include a 266M bit/sec. ability with an optical interface module.

Pricing starts at \$1,995.

**Jaycor Networks**

(619) 535-3121

[www.jaycor.com](http://www.jaycor.com)

**MICRO NETWORKS CORP.** has announced MN3920 and MN3921, 8-bit, 150-MHz flash analog-to-digital converters for industrial and commercial systems.

According to the Worcester, Mass., company, the converters can be used in applications that include video digitizing.

Pricing starts at \$72 each in quantities of 100.

**Micro Networks**

(508) 852-5400

[www.mnc.com](http://www.mnc.com)

**MERIDIAN DATA, INC.** has announced plug-and-play CD NetROM Remote and CD Net Remote, software for configuring Novell, Inc. NetWare networks that use CD-ROMs.

According to the Scotts Valley, Calif., company, both products connect directly to Ethernet 10Base-T networks. They were designed to eliminate the process of having to shut down the NetWare file server to add expansion boards.

Pricing starts at \$4,835.

**Meridian Data**

(408) 438-3100

[www.meridian-data.com](http://www.meridian-data.com)

**TECHNO  
O  
Y  
S**

**Win A Cool Prize  
Every Week!**

Enter the TechnoToys  
Sweeps in  
Computerworld  
Marketplace

(Delivering IT Careers)



**ABSTRACTION SOFTWARE** has announced Prophesy Version 3, a Windows-based network and workflow visual simulation system for simulating computer networks and workflow systems.

According to the Highlands Ranch, Colo., company, Version 3 adds Prophesy Express, an interface that acts as a wizard

to enable fast model construction. It lets users play "What if?" scenarios to answer questions that network designers face.

Prophesy Version 3 costs \$599.

**Abstraction Software**

(303) 791-6600

[www.abstraction.com](http://www.abstraction.com)

**PROFORMA CORP.** has announced ProVision Workbench Version 2.2, with a

new Internet/intranet tool to add business process re-engineering to the World Wide Web.

According to the Southfield, Mich., company, the software allows companies to model business processes and design them for cost-effectiveness.

Pricing starts at \$1,695.

**Proforma**

(810) 443-0055

[www.proformacorp.com](http://www.proformacorp.com)

**By Invitation Only**

**COMPUTERWORLD**

**intr@net '97**

**Monday, June 23 through**

**Wednesday, June 25, 1997**

**The Westin St. Francis Hotel**

**San Francisco, California**

Now in its second year, the Computerworld intr@net '97 Conference will bring together more than 250 CIOs and senior IT executives together to explore the benefits of intranet technology and set a corporate agenda for taking this technology into the 21st century.

We'll cover topics ranging from:

- Process and Environments
- Bandwidth Requirements
- ROI
- And the know-how to put this exciting technology to work for your organization.

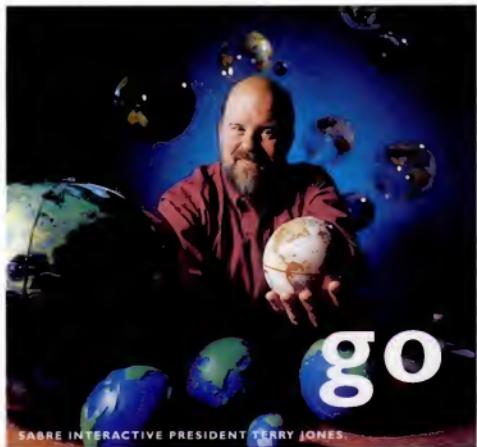
This is the only conference dedicated to intranets for senior IT executives. For more information or to be considered for an invitation, call our registration hotline at (800) 340-2366. But hurry, this conference was sold out last year!

Sponsors as of April 2, 1997: **Novell** **MCI**

**COMPUTERWORLD**  
The Newsweekly for Information Technology Leaders

[www.computerworld.com](http://www.computerworld.com)

Computerworld intr@net '97 Conference is a service mark of IDG. All other companies are trademarks or registered trademarks of their respective holders



“because we  
want our  
customers to  
go away,”

SABRE INTERACTIVE PRESIDENT TERRY JONES

and other sound business reasons Travelocity  
uses Silicon Graphics WebFORCE servers.



When your Web site connects directly to the system that books nearly one-third of the world's electronic travel reservations, your servers had better be accommodating. Which is why SABRE® Interactive chose Silicon Graphics® WebFORCE® servers for their Travelocity™ Web site. Our WebFORCE servers combine 64-bit MIPS® RISC microprocessors with the highest data throughput in the market. The revolutionary system architecture, with

industry-leading I/O performance,



lets their Web site handle anything. And because Silicon

Graphics offers the widest range of compatible servers, they can

easily scale their site to handle even more. All of which means that Travelocity is getting a lot of mileage out of

our servers. You can, too. For more information call 800.636.8184, Department LS0071 or visit us at [www.sgi.com/Products/WebFORCE](http://www.sgi.com/Products/WebFORCE).



**SiliconGraphics**  
Computer Systems

\* See what's possible



© 1997 Silicon Graphics, Inc. All rights reserved. Silicon Graphics, WebFORCE, and the Silicon Graphics logo are registered trademarks. MIPS, Origin, Origin-300, Origin200, the WebFORCE logo and See what's possible are trademarks of Silicon Graphics, Inc. MIPS and the MIPS RISC Chip Processor logo are registered trademarks of MIPS Technologies, Inc. SABRE is a registered service mark and Travelocity is a service mark of The SABRE Group, Inc.

# The Internet

The World Wide Web • Intranets • Online Services

## Briefs

### Search engine loading

If your customers are looking for you on the World Wide Web, they're probably scanning a search engine, newsgroup or directory for your firm's listing. The Millennium Web Promotion Spider automatically submits Web sites to more than 150 search engines, newsgroups and directories. The software costs \$49.95. It runs on Microsoft Corp.'s Windows 95 and is available immediately from Millennium Publications, Inc., in Denver.

### Web-enabled workflow

Staffware Corp., in Wellesley, Mass., this week will roll out Staffware Global, a World Wide Web-enabled workflow system. The software has a graphical development environment and a client that comprises a set of Java applets designed to run within Web browsers. Staffware Global will be available in the second quarter. Pricing isn't available.

### Real-time protection

Intrusion Detection, Inc., in New York (www.intrusion.com) later this month will release a real-time network security monitoring package for Windows NT. The Kans Security Monitor will check for activity such as numerous log-on attempts or efforts to break in to a top executive's PC. The product will alert a company's security officer if it finds suspicious activity.

**Computer intrusion reports**  
received each year by the  
Computer Emergency Response  
Team (CERT) at Carnegie Mellon  
University's Software  
Engineering Institute since it  
was founded in November 1988:

1989	132
1990	252
1991	406
1992	773
1993	1,334
1994	2,341
1995	2,412
1996	2,573

Source: CERT, Pittsburgh

# Spreading knowledge

► *Intranet puts all of Arthur Andersen's know-how in hands of consultants at client sites*

By Justin Hibbard

ARTHUR ANDERSEN & CO. is sending each of its consultants out to customer sites armed with a 35,000-page three-ring binder called an intranet.

At least that's what managers at the Chicago-based professional services firm had in mind last year when they decided to move the company's entire body of knowledge to an intranet called KnowledgeSpace, now available to employees worldwide.

During the past year, Andersen has taken CD-ROM-based content from each of its major businesses — which specialize in business practices, information technology, accounting and



**Andersen's Mark White:**  
Firm standardized on Microsoft Intranet products to leverage Visual Basic skills

vertical industries — and ported the material to the new system.

Using KnowledgeSpace, individual consultants can bring the company's collective knowledge

to bear on their clients' business problems.

For instance, Mark D'Arcy, a manager in Andersen's Business Consulting group, recently visited a Northwestern company that needed help controlling its growth. Using the client's Internet connection, D'Arcy accessed KnowledgeSpace and quickly found answers — not on pages posted by his business unit, but on pages posted by Andersen's Global Best Practices group. The client was impressed.

"They could see the value of the company as opposed to the value of the individual," D'Arcy said.

#### KEEPING UP

Leveraging corporate knowledge through an intranet has become a matter of staying competitive in the professional

services industry. KPMG Peat Marwick, Coopers & Lybrand and Booz Allen & Hamilton, Inc., all in New York, launched major initiatives last year to put browsers on every desktop and move corporate knowledge into databases connected to web servers.

Such projects aren't trivial, however. Andersen spent about \$1 million and eight months designing and building its system, including three months spent porting more than 35,000 pages of content from CD-ROM to the intranet. The intranet has become so integral to the company's strategy that Andersen isn't counting pennies to justify the intranet's cost.

"It's an investment, not a cost," said Sue Landri, operations manager at Andersen's Andersen, page 64

### BRAINSHARE '97

## Novell takes wraps off new Internet packages

By Laura Di Dio  
SALT LAKE CITY

NOVELL, INC. showcased its forthcoming Proxy Cache and Border Services offerings at its recent Brainshare '97 developer's conference here. The technologies were designed to give businesses a set of secure, managed intranet and Internet capabilities.

Novell hopes its new technologies and the Internet vision of new CEO Eric Schmidt will help it make the transition from being a network operating systems vendor to being a network services company.

#### NOT SO HOT

Until now, user response to Novell's Internet and intranet initiatives has been tepid at best, said Jamie Lewis, president of The Burton Group.

Inc., a consultancy here.

The Proxy Cache technology was designed to increase the throughput and performance of Novell's IntranetWare servers by storing frequently used World Wide Web pages or other documents so the proxy server can answer requests without having

Novell's Proxy Cache and Border Services software feature the following directory-enabled NetWare Loadable Modules:

- Proxy Server
- Virtual Private Network component
- A firewall for secure Internet communications

to download pages from the Internet.

The Border Services Suite provides Internet access to IntranetWare networks that use firewalls and existing IntranetWare security.

Mike Hicks, a systems engineer for the city of Tucson,

Ariz., said the Novell package suits him fine. Tucson is upgrading its 300 NetWare servers to IntranetWare 4.11, and Hicks said he can't wait to get Border Services. "From what we've seen, they will give us the ability to secure our networks and provide a high level of services to our end users," Hicks said.

#### WAIT AND SEE

But Mike Crowley, vice president and chief information officer at Rich Products Corp. in Buffalo, N.Y., said his company is waiting to see how fast and how good Proxy Cache and Border Services are before it commits to any IntranetWare upgrades.

"Novell has been getting its act together to a certain degree," Crowley said. "But right now, Novell and 100 other companies are all telling us how they're going to make us more Internet- and intranet-enabled and geared for electronic commerce. We won't really know who to believe until we do detailed internal product testing."

Border Services is a suite of Novell Directory Services. Novell, page 64

## Providers slowly picking up on 56K bit/sec. modems

By Mitch Wagner

INTERNET SERVICE providers are slowly but surely signing up to support 56K bit/sec. modems, but they are waiting until modem vendors sort out their standards wars before aggressively deploying the fast modems.

Three of the nation's largest Internet service providers and online services already have deployed 56K bit/sec. modems from U.S. Robotics Corp. in Skokie, Ill. Another provider expects to deploy the modems this month, and one more will deploy the technology in May.

#### CAUTIOUS APPROACH

Almost all the largest Internet service providers in the country plan to have some type of 56K bit/sec. modems deployed by year's end, according to interviews conducted by Computerworld.

But many are taking a wait-and-see approach on the tech-Internet providers, page 64

# Arthur Andersen delivers better service via intranet

CONTINUED FROM PAGE 63

Global Best Practices unit.

Nevertheless, the savings gained from the system are clear.

For D'Arcy, obtaining the same information for his client using Andersen's previous system would have meant dialing in to several Andersen servers, calling other consultants and waiting days for packages to arrive via courier.

Using KnowledgeSpace, he had same-day access to information posted by other consultants worldwide.

#### DIFFERENT SYSTEM

When the company distributed information primarily on CD-ROM, the production process required several stages of formatting, much like book publishing.

Now the company stores documents in a SQL Server database, which dynamically builds pages in response to user queries using the Active Server Pages feature of Microsoft Corp.'s Internet Information Server.

IS staffers known as knowledge work-

ers collect documents from all over the company and add metadata to classify the documents and make them searchable. Then they use a custom Visual Basic application to load the documents in the database.

Mark White, head of knowledge systems and network development at Andersen, said the company selected Microsoft technology to leverage its installed base of Microsoft software and the Visual Basic skills of Andersen's developers.

"They've got a collaborative and publishing hybrid," said Mike Gotta, an analyst at Meta Group, Inc. in Stamford, Conn. "They use Lotus Notes to capture all the content and then use Active Server to dynamically assemble all the parts."

Other products for database publishing include LiveWire from Netscape Communications Corp. in Mountain View, Calif., and Cold Fusion from Allaire Corp. in Cambridge, Mass. Both products link web servers to databases. □

# Internet providers slowly picking up on 56K bit/sec. modems

CONTINUED FROM PAGE 63

nology, while a standards conflict plays out between U.S. Robotics and the alliance of Lucent Technologies, Inc., Motorola, Inc. and Rockwell Semiconductor Systems.

The Internet service providers have announced the following:

- America Online, Inc. in Vienna, Va., is testing U.S. Robotics technology in New York, Washington, San Francisco, Chicago and Skokie. Further deployment will depend on the results of those tests. America Online officials wouldn't say how many users are involved or how long the tests will run.

- AT&T Corp. in New York has no plans for the 56K bit/sec. modems. An AT&T spokesperson said because of the spotty quality of local telephone lines, the company doesn't believe 56K bit/sec. throughput is possible, even with faster modems.

- BBN Planet in Cambridge, Mass., has no specific plans for deployment, but it is testing modems in-house.

- CompuServe, Inc. in Columbus, Ohio, has deployed U.S. Robotics modems on its toll-free access numbers. It won't deploy modems generally until vendors agree on an industry standard.

- Washington-based MCI Communications Corp. is testing U.S. Robotics modems. The company expects to deploy them nationally by midsummer. It will support the competing modem specification when those modems are available.

- Mindspring Enterprises, Inc. in Atlanta has deployed U.S. Robotics modems at five points of presence: Atlanta and the Florida cities of Miami, Orlando, Tampa and Fort Lauderdale. A spokesperson said the company expects to have the modem deployed by June at 40 points of presence, including points in Georgia, North Carolina and South Carolina.

- Beyond those areas, Mindspring relies on PSinet, Inc. in Herndon, Va., for its national network. PSinet is testing the modems but has no immediate plans to deploy 56K bit/sec. modems generally.

- Netcom On-Line Communication Services, Inc. in San Jose, Calif., will support U.S. Robotics modems in and around Chicago, Los Angeles, San Francisco, New York and Boston by mid-April. By year's end, the company will add modems in the Philadelphia, Washington, Seattle, Denver, Atlanta and Dallas areas.

- Sprint Corp. in Westwood, Kan., has no specific plans for deployment. A spokesperson said Sprint hopes to roll out 56K bit/sec. modems by year's end, when it expects a single standard to emerge.

- UUnet Technologies Inc. in Fairfax, Va., is testing both modems in laboratories, plans early field tests in May and will make 56K bit/sec. modem support generally available in June. It will decide which standard to support based on which seems most popular then. □

## Snapshots

### ONLINE CONSUMERISM

63% of U.S. consumers have shopped online (gathering information about products or services)

39% have placed orders online (requested a product, whether or not payment was made online)

23% have paid for a product via an online transaction

Source: 1997 Cybercitizen Report by Yankelovich Partners, Inc., Norwalk, Conn., a survey of 624 people who say they have been online

## NEED AN INVENTORY SOLUTION?

### WE HAVE ONE.

Donating your excess inventory earns a generous tax write-off for your company. And creates college scholarships for needy students. EAL can convert your donation of inventory into financial aid.

### A GREAT SOLUTION.



Request a free guide to learn more.

Call (630) 690-0010

Fax (630) 690-0565

Email  
scholar@eduassist.org

**EAL**

Educational

Assistance Ltd.

P.O. Box 3021

Glen Ellyn, IL 60138

Excess inventory today ... student opportunity tomorrow

---

COMING MAY 5TH:

# ADAPTIVE NETWORKING<sup>TM</sup>

\*

## A HEIMLICH MANEUVER FOR ALL THOSE FAT APPLICATIONS CHOKING YOUR NETWORK.

---



Bay Networks

Don't miss Dave House's keynote address on May 5th at InterOp. Then visit us at Booth 2105.

©1997 Bay Networks, Inc.

If you can only afford to participate in one conference this year, make it the one presented by your user group!

**Incredible opportunities to hear from the industry's big guns:**

- Oracle VP Product Strategy Ken Jacobs
- Father of the Data Warehouse Concept Bill Inmon
- Oracle Sr. VP Americas Barry Arko
- IOUG-A President Merrillie Nohr
- Experts like Steve Feuerstein, Kevin Loney, Mike Corey, Katherine Oakey, Rich Nemic, Paul Dorsay, Michael Abbey, Bonnie O'Neill and more!

**Oracle8 all over the place!**  
Technical presentations include:

- Migrating from Oracle7 to Oracle8
- Designing for Oracle8
- Oracle8: A New Expanding Frontier and As Always an Expanding Data Dictionary
- Modeling with Oracle8
- Sleeping With the Enemy: Oracle8 Access to Non-Oracle
- Implementing PL/SQL Projects for a 3-Tier Design Towards Oracle8
- Transforming the Application Object Model to the Oracle8 DLL/DLM Implementations Using Object Types

**User perspectives - unblased and objective.**

IOUW '97 is planned and presented by users for users, guaranteeing that its 200 technical sessions will be long on content and short on fluff. Other educational highlights include popular mini lessons, IOUG-A University, Ask Oracle sessions, a 100 booth exhibit hall, and networking events.

**What you need to know about network computing.**

Listen closely as the experts from Network Computer, Inc. explain:

- The Network Computer: Developing the Infrastructure for the Future of Computing
- Building Multi-Tier Client/Server Applications Using NC's and Oracle's Network Computer Architecture

**International Oracle User Week '97**  
**April 27-May 2 - Dallas**

**Save \$100** Mention this ad when you register and receive \$100US off applicable rates. Call 800.647.4689 or +1.312.527.6642, or visit [www.ioug.org](http://www.ioug.org).



The International Oracle Users Group - Americas (IOUG-A) is an organization of users of Oracle products and services and is independent of Oracle Corporation.

# Intranets begin to alter corporate culture

By Rebecca Sykes  
BOSTON

MANY CORPORATIONS are sharing a common experience as they try out intranet technology — namely, that it is very easy to set up.

But the kind of problems being tackled with intranets is varied, as are the results, according to users who shared their experiences recently at the Zonathon '97 conference here.

Intranets can do more than link people and data. They can affect a company's whole corporate culture, as the employees and executives at Citibank are learning. At Citibank, which is just beginning to experiment with intranets, information is still fragmented and hard to find. Each department is enmeshed in its own work, said Ewart Newton, a Citibank vice president in New York.

Only 70,000 of the company's 90,000 employees worldwide are in the company's electronic-mail directory. That complicates communications, especially between employees in different nations.

Getting access to internal company information is difficult, at best. "If someone wants my knowledge, they've pretty much got to find me," Newton said.

But the intranet is changing all that, and not just by making information readily available. The intranet changes the responsibilities of employees, Newton said. Those with information can no longer sit back and wait for colleagues to ask them for it. With intranets, "it's up to me to make that information available to the public domain," Newton said.

Active information-sharing is counter to Citibank's historical corporate culture, according to Newton. For years, internal competition "was part of our culture, it was fostered," he said. Now that culture is giving way to cooperation and

information sharing, he said.

For global companies, the change wrought by intranets is as profound as it is necessary, Newton said. Information sharing is a precondition to operating a global franchise, and companies that want to establish or maintain a global presence must cast off internal competition and seek ways to share information.

At Citibank, intranets are the means to that end. "We believe that the intranet is the first real enabler," Newton said.

#### TIMBERLAND CLIMBS ONLINE

The first intranet foray for The Timberland Co., a clothing and footwear manufacturer, met with quick success. Users quickly clamored for more functionality, including multimedia.

Timberland employees used E-mail and, to a small extent, Lotus Development Corp.'s Notes to share information. But employees typically shared information in person, even on routine issues, according to Dan Grosz, director of business systems planning at Stratham, N.H.-based Timberland.

Timberland put its sales catalog on a web server as a pilot test for its intranet project, a process that took two months, according to Grosz. Timberland's salespeople used the intranet to access the company's catalog from the road and to help make sales pitches during calls on customers, Grosz said. For example, with the catalog online, salespeople can copy parts of it into Microsoft Corp. PowerPoint presentations, Grosz said.

Having proved the value of the intranet to roving users, the company plans more intranet projects, including using the network to give users greater access to legacy systems, according to Grosz. □

Sykes writes for the IDG News Service's Boston bureau.

#### NEW PRODUCTS

**TATUNG SCIENCE & TECHNOLOGY, INC.** has announced a 64-bit World Wide Web server powered by two 200-MHz Ultra-SPARC processors.

According to the Milpitas, Calif., company, the Computation U Model 2200 was designed for Internet service providers that must support hundreds of customer Web sites.

The product has high-speed data transfer and memory that is expandable up to 2G bytes, with storage of up to 8G bytes on the internal hard drive.

It costs \$22,225.

**Tatung Science & Technology**  
(408) 383-0988  
[www.tsti.com](http://www.tsti.com)

**SCALA COMPUTER TELEVISION, INC.** has announced Scala MultiMedia MM-200, business presentation software that includes point-and-click Internet publishing.

According to the Herndon, Va., vendor, the MM200 lets a user prepare a presentation for reproduction and distribution by taking all the files that comprise a presentation and saving them as one file for easy distribution over the Internet. It allows cutting and pasting from other programs.

The MM200 costs \$299. **Scala Computer Television**  
(800) 947-2252  
[www.scala.com](http://www.scala.com)

# Computerworld Custom Publications

*Where IT Leaders Find  
Technology Solutions*

Computerworld's custom publications are an excellent resource for learning about specific solutions on critical technology issues and challenges. Sponsored by leading IT vendors, these custom publications are produced by a dedicated custom publishing staff at Computerworld. Working with well-known industry analysts from IDC, Gartner Group and other third party sources, this group brings you a variety of special publications that provide the focused perspectives that help you effectively deliver information technology to the enterprise.

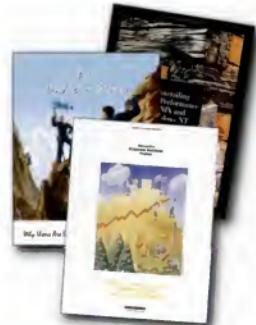
*For sponsorship information contact:*

Elaine R. Offenbach  
Vice President  
Computerworld  
Custom Publications  
Phone: (415) 347-0555  
Fax: (415) 347-8312  
E-mail: elaine\_offenbach@cw.com



## White Papers

*With an in-depth focus on a major technology platform or technology management issue, Computerworld White Papers are highly regarded by information systems professionals*



## Custom Supplements

*Technology briefings that provide strategic direction for the busy IT manager*



*Technology Roadmaps  
Infographic reference guides to the design and implementation of critical technology platforms*

## Look for These Upcoming Custom Publications in Computerworld

Issue Date	Title	Space Close	Materials Due
Mar. 31	Solutions Series: Year 2000: Organizational Issues (part 1 of 2)	Feb. 14	Mar. 7
Apr. 21	White Paper: Data Mining Leverages Warehouse Info	Mar. 7	Mar. 28
May 5	Supplement: Electronic Software Distribution Distribution at Network + Interop	Mar. 21	Apr. 11
May 12	White Paper: Evolution of Systems Management Distribution at DB/EXPO	Mar. 28	Apr. 18
Jun. 2	Solutions Series: Year 2000: Products (part 2 of 2) Distribution at PC Expo	Apr. 18	May 9

Computerworld Custom Publications are written and produced independently of the Computerworld editorial staff.

To order back issues, contact Heidi Broadley at (508) 820-8536

# COMPUTERWORLD

**Is this the time for a  
GO WITH THE PACK,  
PLAY IT SAFE  
approach for your  
business?**

**Damn right it is.**

The Year 2000 is right around the corner. Is it time to take chances with your business? Or time to go with a tested, proven Year 2000 leader? Like Peritus.

The fact is, more companies and service providers across the world are currently using Peritus as their Year 2000 partner. The reasons? Performance and flexibility, to name a few. Only Peritus provides a full suite of Year 2000 conversion alternatives to meet your needs, from data expansion to logic correction and simple data compression, and capabilities such as complete identification.

Whether your system is mission critical or at the end of its life cycle, you can choose a

tailored Year 2000 solution that's right for you.

There's something else you get from Peritus—peace of mind from partnering with the world's leader in creatively managing the installed software base. In fact, our Year 2000 solutions are only one of the many solutions available from Peritus, the company that's blazing new trails in software evolution. We're changing the way people think about software. And we're giving people the power to make more business choices than were ever thought possible.

Are we saying Peritus is right for your company? Damn right we are. Call Peritus today at 1-800-598-7787 for more information, or visit our web site at [www.peritus.com](http://www.peritus.com).

**Peritus®**

*Creative Excellence in Software Evolution*

# Corporate Strategies

Case Studies • Trends • Outsourcing

## Briefs

In a survey of 1,200 CIOs, CEOs and other senior managers at the Healthcare Information and Management Systems Society conference in February, 62% of respondents said they expect their IT budgets to increase between 10% and 40% in the next two years.

But health care IS professionals cited a variety of frustrations in achieving their IT goals, including:

Lack of a strategic IS plan  
**22%**

Difficulty in finding and retaining good technical staff  
**19%**

Keeping up with changing technology  
**12%**

Source: "Trends in Health Care Computing," sponsored by Healthcare Information and Management Systems Society, Chicago, and Hewlett-Packard Co., Palo Alto, Calif.

**Millennium tips on Web**  
The Society for Information Management (SIM) Year 2000 Working Group has launched a World Wide Web site to promote the exchange of best practices, tips and opinions about the year 2000 issue.

Participants can enter for free at the SIM home page at [www.simnet.org](http://www.simnet.org) and can link to the SIM Year 2000 Working Group's Web page.

### \$9.3M year 2000 pact

Computer Horizons Corp., in Mountain Lakes, N.J., has been awarded a \$9.3 million year 2000-compliance contract by Lutheran Brotherhood, a Minneapolis-based insurance and financial services company. Under the terms of the deal, Computer Horizons will convert Cobol, assembly, Ideal and SAS Institute, Inc. programs for the insurer.

## ► Despite delays, Exchange automation project succeeds

By Maryfran Johnson  
ZURICH

**I**N A NATION legendary for discreet public bankers and efficient management of great wealth, controversy has hardly been welcomed with open arms.

Then along came the Swiss Exchange project, an ambitious undertaking to create a completely automated electronic securities trading system.

This showcase of Unix-based distributed client/server technology ran 18 months over deadline and tens of millions of dollars over budget.

Yet the world's seventh-



Swiss Exchange's Juerg Spillmann:  
"What we've really created is an automated chain which can run without any intervention - and quite fast."

largest exchange eventually emerged as unique in the unruly, frantic business of securities trading. With a daily volume of 30,000 to 50,000 trades, the

Swiss Exchange confirms and settles 90% of its trades within 10 minutes — a process that takes anywhere from one to five

Swiss Exchange, page 70

## Net computers push PC strategy into retirement

By April Jacobs  
and Michael Goldberg

WHEN THE NEW CIO at the largest mail-order prescription company in the U.S. got marching orders to take it into the 21st century, he thought: network computers.

Retired Persons Services, Inc. (RPS) had to be cost-effective and competitive in a discounted drugs market that is growing each year, said Chief Information Officer Donovan Resh.

His Reston, Va.-based company is the pharmacy arm of the American Association of Retired Persons.

Resh said his primary job last summer was to make the prescription-filling process less labor-intensive, while making the business more competitive

Network computers, page 72



"The cost of ownership is the primary concern."  
- Donovan Resh  
Retired Persons Services

## Disparate firms share in training

By Thomas Hoffman

**U**NITED HEALTHCARE CORP. is a Minnetonka, Minn.-based health care provider, and Hartford, Conn.-based United Technologies builds Otis elevators and Carrier air conditioners.

Despite their differences, the two companies have found common ground to share resources for training.

By videoconferencing seminars to desktop users and information systems staffers, both companies spend less on individual courses to train workers in subjects such as IBM CICS and Microsoft Corp. Excel spreadsheets.

Executives at both companies said they aren't sure how much money the 3-month-old partnership will save, but one training expert said similar collaborations have yielded 40% savings in stand-alone training costs.

The project, launched in January, is being coordinated by Rensselaer Learning Institute (RLI) in Hartford, Conn. RLI has provided long-distance technical training to United Technologies' 160,000-person workforce since 1992.

Seeking ways to cut costs under managed health care, United Healthcare decided it, too, needed a more effective way to provide training to its remote staff.

"We had no infrastructure to support the development of our employees," said Allen Stein, director of The United Health Care Learning Institute, which handles training for 29,000 employees as far-flung as South Africa and Ireland.

United Healthcare's annual training budget more than dou-

Training focuses on specific skills and skips over introductions and irrelevant topics.

Training, page 70

# Swiss Exchange finds success

CONTINUED FROM PAGE 69

days at the larger U.S. stock exchanges.

"What they've done among the major exchanges of the world is absolutely unique," said Octavio Marenzi, a research director at Meridien Research, Inc. in Needham, Mass. "Most of the other exchanges have automated one portion of the whole trading process, but the Swiss Exchange automated everything from A to Z, the whole life cycle of the trade."

The business benefit was threefold. It created an open, level playing field for every member of the Exchange, because all trading activity is visible online within minutes.

It also saved those same members the money they previously spent to maintain people-intensive, back-office operations to track all the paper involved with securities trading.

But most important to the Exchange, the upgrade helped it stem the loss of business to the London Stock Exchange (see story at right).

"What we've really created is an automated chain which can run without any intervention — and quite fast," said Juerg Spillmann, head of the IT division of the Swiss Exchange. Spillmann said the Exchange turned over the equivalent of \$4.6 billion on a recent trading day.

#### MEGAMERGER

Led by large banks, a host of financial firms underwrote the Elektronische Börse Schweiz (EBS) system project in the early 1990s. In 1993, the country's three separate exchanges were merged with the Swiss Option and Financial Futures Exchange (SOFFEX) to create the Swiss Exchange.

"It was a very painful process for everyone at the time," recalled Marenzi, who was in charge of IT planning at Union Bank of Switzerland while the EBS system was being built. Original cost estimates of 80 million Swiss francs (about \$60 million) proved too modest. "The development of the Ex-

change cost [about \$112 million], but that's pure development, project costs and training only — not hardware costs," said Spillmann, who helped create and now manages the integrated EBS and SOFFEX systems. The systems have been in full operation for several months. Next month, the Exchange will ship the next full maintenance release of the customized EBS trading software to its 54 member banks and financial institutions. That release will be based on Sun Microsystems Inc. UltraSPARC servers and Sybase, Inc.'s Sybase 11 database software.

At the core of the trading system is a cluster of 6.4-bit Alpha-Server systems that run OpenVMS and are equipped with Reliable Transaction Router (RTR), Digital Equipment Corp.'s fault-tolerant transaction messaging middleware. RTR serves as the underpinning for a high-speed Digital Network that connects 1,000 nodes at financial institutions throughout

## Looking for an edge

The driving force behind the creation of the world's only end-to-end electronic exchange was partly sheer business rivalry.

"The Swiss were losing a fair amount of trading activity to the London Stock Exchange, so they were looking to gain some leadership again," said George Kivel, group director of wholesale banking at The Tower Group, a financial analysis firm in Newton, Mass.

Regaining a leadership role also was important for creating a competitive marketplace for Switzerland's financial center, especially with the 1999 deadline looming for the development of one big European market, analysts noted.

"What they have today is a winning system. The trade volumes have gone up dramatically, probably 40% for this year," Kivel said.

Financial industry watchers said the Exchange members — who collectively spent at least \$350 million in the last few years to update their own back-office operations to take advantage of electronic trading — are quickly realizing substantial paybacks. One member bank reported a \$14 million savings in its first year with the new system.

"For the big three Swiss banks — Credit Suisse, UBS and Swiss Bank Corp. — the savings could easily amount to \$15 million a year in back-office consolidations," said Octavio Marenzi, a research director at Meridien Research. — Maryfran Johnson

## Training unites firms

CONTINUED FROM PAGE 69

bled to \$2.3 million after Stein arrived last May. The company's previous training budget "was spent without any strategic approach to it," Stein said.

It was spending much of that money on travel and losing money on diverted work costs, and course content wasn't always specific to employees' jobs,

**Education "is not a core product line of companies. It's how they use education that can have an impact on their competitive position."**

— Steve Biegleyki,

**United Technologies**

he said.

United Healthcare isn't alone. Education "is not a core product line of companies. It's how they use education that can have an impact on their competitive position," said Steve Biegleyki, director of technical education and training at United Technologies, which spent \$28 million on training and development for its staff last year.

For United Healthcare, much

has changed since Stein came aboard. The company last month customized what had been a 7.5-hour off-site Lotus Development Corp. Notes 4.1 course into a pair of two-hour multimedia sessions.

The seminars were presented by an RLI instructor over Integrated Services Digital Network connections to 15 staffers in Troy, N.Y., Hartford, and Somerset, N.J.

The sessions focused specifically on modules that employees needed to learn. "We believe our employees will be able to get a higher skill transfer this way," Stein said. He may be right. By using customized computer-based training programs that eliminate lengthy course introductions, or "yada-yada stuff," companies can typically slash training time in half.

And they can "cut out topics that are irrelevant to your job," said Brandon Hall, editor and publisher of "Multimedia & Internet Training," a newsletter in Sunnyvale, Calif. □

## Social Security

CONTINUED FROM PAGE 69

Estimates from an average of 2,900 per week to 7,800, Carter said. Officials are waiting until they are satisfied that problems will be ironed out at current usage levels before they promote heavier usage of the service.

Most requests are still made via paper forms that cost the agency about \$5.23 each to process vs. "almost nothing" for each additional electronic query, Carter said.

The agency has been ordered by Congress to provide annual estimates for every worker over age 25 — about 123 million people — by 2000. "It's a very expensive mandate," Carter said. "Everyone who does it [online] won't have to get one mailed. We believe it will save a lot of money."

The estimates include a detailed history of reported earnings and Social Security and Medicare taxes paid, as well as projected retirement, disability and other benefits. The reports help find data errors, such as workers at small businesses who weren't properly credited for taxes they paid. About 2% of all Personal Earnings and Benefit Estimate Statements contain

such errors, Carter said.

The agency is using the Secure Sockets Layer (SSL) protocol to encrypt data during the online transactions.

Recent versions of Netscape Communications Corp.'s Navigator and Microsoft Corp.'s Internet Explorer support SSL. Some other browsers, including text-based Lynx for Unix, don't.

#### SECURITY CONCERN

While Social Security officials believe SSL will safeguard data transmitted over the Internet, the agency also warns users that it "cannot absolutely guarantee that the information ... will not be intercepted by others and decrypted." Users can still receive estimates by mail.

SSL is one of the most popular network security protocols in use. More than 10% of Web servers queried by O'Reilly and Associates, Inc. in Sebastopol, Calif., had enabled SSL for Internet transactions, according to a December survey.

The agency also must try to protect the data from impostors who attempt to find out information about other people through the system. The elec-

tronic form includes two extra questions not found on the paper version — the taxpayer's place of birth and mother's maiden name — to verify an individual's identity.

Although he urged Social Security to tightly monitor the site to prevent abuse of the data, privacy advocate Marc Rotenberg endorsed the concept.

"One of the principles of privacy protection is the right of individuals to access their information" held by the government, said Rotenberg, director of the Electronic Privacy Information Committee in Washington. "I think it's a step in the right direction."

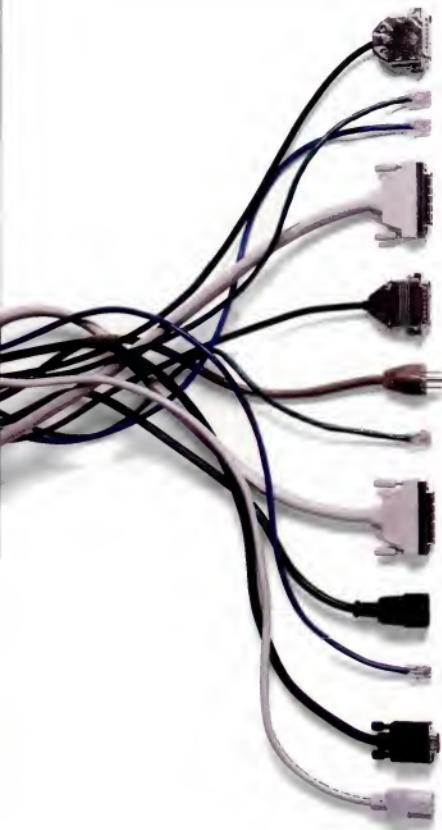
A few glitches have cropped up so far, Carter said, such as "some quirky complaints" from America Online, Inc. Users' problems have been linked to specific versions of AOL's browser, he said.

And some users seem unwilling to scroll through detailed instruction forms before seeking their benefit estimate. "We are running into the nature of the Web," said John Sabo, director of electronic services staff at the Social Security Administration. "Many, many Web users are not patient. People don't necessarily want to read help screens or instructions ... but you cannot make everything intuitive." □



# NT CLUSTER~IN~A~BOX

You can configure a lot of these, or you can just plug this.



Good choice!



Get the industry's first Microsoft Windows NT clustering solution packaged in a single, rackmounted system. With Data General's NT Cluster-in-a-Box,™ your company now has an NT clustering solution that will let you run your critical applications 24x7x365, in a system that you simply plug in and turn on. Our NT Cluster-in-a-Box includes:

- Two AViON® AV3600R servers based on Intel Pentium® Pro processors
- A fault-tolerant CLARiiON® RAID storage system and
- NTAlert™ - the industry's only NT-based remote service for early identification of potential problems. We also pre-load not only Windows NT Server, but Firstwatch for NT - failover software from Veritas Software. All of these components, plus service, support, and integration, from one vendor. In one package. The choice is clear. Unless you want to spend a lot of time just plugging away.

**AVION**

 **Data General**

**NO TIME FOR DOWNTIME - FREE SEMINARS**

**AVOID DOWNTIME FOR YOUR CRITICAL NT APPLICATIONS.**

**Seminars begin in April. To register, visit our Web site at [www.dg.com](http://www.dg.com), or call 1-800-DATA GEN.**

AViON and CLARiiON are registered trademarks. Cluster-in-a-Box is a trademark, and NTAlert is a service mark of Data General Corporation. The Intel Inside logo and Pentium are registered trademarks and the Pentium Processor logo and the Pentium Pro Processor are trademarks of Intel Corporation. All other brands or products are the trademarks of their respective holders. © 1997 Data General Corporation.

# Net computers retire PC strategy

CONTINUED FROM PAGE 69

as it faces challenges in a burgeoning market.

Resh said RPS first started looking at network computers in October. The company had intended to go with PCs for 1,000 employees who primarily work at a prescription-order fulfillment center in Horsham, Pa., and a call center in Roanoke, Va.

Those employees fill 40,000 drug prescriptions daily for a clientele of millions. The new use @Workstations from HDS Network Systems, Inc. in King of Prussia, Pa.

## COST ANALYSIS

A major factor in the decision to use network computers was a two-phase cost analysis, Resh said. "The cost of ownership is the primary concern," he said.

Resh's analysis indicated that the company would spend \$1.9 million on 1,000 network computers and 20 multiprocessor servers from Advanced Logic Research, Inc. in Irvine, Calif.

That is \$500,000 less than it would have cost the company to outfit 1,000 desktops with PCs

supported by 10 servers, Resh said.

While installing the network computers, RPS also is going through a back-office modernization.

The company is migrating from Digital Equipment Corp. legacy VAX servers that run VMS to newer AlphaServers that run Digital Unix to support new financial, human resources and order-fulfillment applications on an Oracle Corp. database. The company also is designing a wide-area network to link offices around the nation.

Resh said the primary benefit of network computers for RPS is in the estimated cost of ownership over five years.

It costs about \$500 annually to maintain a server-centric network computer, compared with an estimated \$7,000 per year to support a 100-MHz Pentium-based PC with 32M bytes of RAM, Resh said.

Spread out over five years, the cost of maintaining 1,000 network computers (\$2.5 million) pales compared with the esti-

mated \$35 million to maintain 1,000 PCs, he said.

One example of the cost savings so far, Resh said, is paid at the help desk. "With [network computers], we saw a reduction within weeks in the cost of our help desk," with end users making fewer calls for help than current and former PC users, Resh explained.

## TASK-ORIENTED

Part of Resh's success is based on the types of users he has.

They do repetitive transaction-based processing such as order entry and drug utilization reviews, he said.

And they use a small number of applications repeatedly that require them to retrieve data, save data or send transactions for processing by the company's back-office systems.

Neil MacDonald, an analyst at Stamford, Conn.-based Gartner Group, Inc., said Resh's decision, which was based on his users' needs for quick access to applications and a user-friendly

Cray officials said they believe the Court of International Trade will rule that the Commerce Department wasn't biased. At the worst, the court could require the Commerce Department to accept testimony from NEC and to appoint new officials to hear the case.

The dispute started last year when Cray, NEC and Fujitsu all vied for an NCAR weather and climate research supercomputer contract. NCAR, a government agency managed by the University Corporation of Atmospheric Research, awarded the contract to NEC.

Cray last July filed a dumping complaint alleging that NEC planned to sell four supercomputers to NCAR at a \$65 million loss. NEC has repeatedly denied the charge.

put the sale on hold since the dumping controversy erupted last year.

The Commerce Department is expected to issue its final decision in August.

The U.S. International Trade Commission also will determine whether the dumping harmed U.S. industry; its decision is expected by October.

The Commerce Department also preliminarily found that Fujitsu Ltd., which competed against Cray and NEC for the NCAR contract, priced its supercomputers at 27.17% below fair-market value.

Fujitsu, in Tokyo, couldn't be immediately reached for comment.

NEC has filed suit against the Commerce Department in the Court of International Trade to get an independent official to investigate the dumping allegations. NEC was unsuccessful in getting an injunction to enjoin the Commerce Department's ruling, and the case is still scheduled to go to trial this month. Cray and NEC officials said.

Spending last year hit 1.6 billion yen, of which 50% was recorded in the last two months of the year, according to Dentus.

**THE SURVEY**

Dentsu's survey looked at ex-

penditures for the production

and placement of World Wide

Web advertising for the domes-

## Year 2000 help for telecom

IBM Global Services in Somers, N.Y., and Bellcore in Morristown, N.J., have formed a strategic partnership to provide year 2000 services to telecommunications carriers. The services are

## NCs don't belong everywhere

Network computers aren't for everyone.

Donovan Resh, CIO at RPS, and observers agreed that the mail-order prescription company's end users were good candidates for network computers, given the repetitive and relatively simple tasks they perform.

Rowan Snyder, chief technology officer at Coopers & Lybrand in New York, said his company rejected network computers outright and went the PC route because of its end users' more complex needs.

The consulting practice has 16,000 mobile workers who use highly customized applications, groupware, electronic mail and Internet access — all of which require remote access, Snyder said.

Greg Blatnik, an analyst at Redwood City, Calif.-based Zona Research, Inc., said RPS "may be ahead of the curve in terms of the volume [of network computers] deployed" but is using the devices in very conventional ways — as end-user stations on a LAN, for example.

Blatnik said many users who conduct a cost-of-ownership analysis might find Resh's big savings in favor of network computers over PCs a tad rosy. "We've come up with differences showing it costs 50% less overall for thin clients," Blatnik said.

Resh said RPS still has 1,000 PCs, and he will look to convert more desktops to network computers. He said he expects to find some reluctance. "There are some people who resist. But if the [chief financial officer] says he needs a PC to run an Excel spreadsheet, I'm not going to fight about it," Resh said.

— April Jacobs and Michael Goldberg

interface, makes sense from cost-of-ownership and performance aspects.

And by implementing network computers, MacDonald

said, applications and performance can be upgraded at the server level, which gives the desktops a long life expectancy, unlike PCs. □

## NEC blasts Commerce on its ruling in supercomputer case

By Sari Kalin

JAPAN'S NEC CORP. last week blasted the U.S. Commerce Department's preliminary ruling that it dumped supercomputers, calling the charge "the result of an unfair and biased investigation."

In a statement through its HNSI Supercomputers, Inc. subsidiary in Boxboro, Mass., NEC charged that the Commerce Department couldn't rule impartially on the dumping allegations.

Those allegations came from Cray Research, Inc. in Eagan, Minn., which filed the dumping complaint last summer.

**ON HOLD**

In a preliminary finding, announced March 31, the Commerce Department said NEC planned to sell four supercomputers to the National Center for Atmospheric Research (NCAR) last year at a price 45% below fair market value.

The National Science Foundation, which controls funding for the \$35 million purchase, has

put the sale on hold since the dumping controversy erupted last year.

The Commerce Department is expected to issue its final decision in August.

The U.S. International Trade Commission also will determine whether the dumping harmed U.S. industry; its decision is expected by October.

The Commerce Department also preliminarily found that Fujitsu Ltd., which competed against Cray and NEC for the NCAR contract, priced its supercomputers at 27.17% below fair-market value.

Fujitsu, in Tokyo, couldn't be immediately reached for comment.

NEC has filed suit against the Commerce Department in the Court of International Trade to get an independent official to investigate the dumping allegations. NEC was unsuccessful in getting an injunction to enjoin the Commerce Department's ruling, and the case is still scheduled to go to trial this month. Cray and NEC officials said.

tic market by information providers in Japan.

Dentsu defines Internet advertising as a medium with independent content with "clearly understood rates according to advertising space."

The ads surveyed included those placed on sites of conventional media companies, search engines and online newspapers, and sites that combine media such as the Web and a CD-ROM. Dentsu said the \$4 billion yen estimate is just a sliver — less than 1% — of Japan's total annual spending on advertising, which will exceed \$46 billion this year. □

Guth writes for the IDG News Service in Tokyo.

## SHOR T

expected to tackle some of the unique requirements of telecommunications carriers, such as date-sensitive equipment that is used between end-to-end telecommunications networks. The services, which now include impact analysis, strategic planning, conversion and testing,

# ARE ALL YOUR MIPS EARNING THEIR KEEP?

ONCE YOU WERE WILLING  
TO PAY FOR MIPS THAT DIDN'T  
PULL THEIR WEIGHT. BUT NOT  
IN THIS MILLENNIUM.

Many mainframe purchases are  
based on Total MIPS — but Productive  
MIPS are the real test of value.

Consider the Amdahl Millennium™  
family of CMOS-based servers — S/390®  
compatible mainframes that deliver  
more Productive MIPS per dollar than  
any other CMOS-based server. Bar none.

Millennium's extraordinary value  
derives from its unique high-efficiency  
design. Unmatched caching with up to  
30 times more capacity for optimum  
processor utilization. Flexible parti-  
tioning for load-matched resource  
allocation. Plus many more innovative  
ways to keep MIPS hard at work —  
handling the mission-critical workload  
of your business.

Interested in servers with a stronger  
work ethic? Talk to Amdahl.

Contact us at  
(800) 223-2215 or  
[www.amdahl.com](http://www.amdahl.com)

**amdahl**  
BRING US YOUR HARD PROBLEMS™

## Managing



Sajoo Samuel, an assistant vice president at First Chicago Trust, says he makes the company's outsourcing strategy work through close day-to-day management

# Outsourcing the 'net

By Gary H. Anthes

Farming out some Internet functions can bring rewards, but it entails some unique risks

## CONTINUED FROM COVER I

It's one thing to outsource something that's rock solid — such as mainframe operations — and quite another to turn over to outsiders something about as stable as Silly Putty.

## SEEING THE WHOLE PICTURE

Eastman Kodak Co., which pioneered the information systems outsourcing idea in 1989, decided five years later to hold on to all its Internet activities, because the environment was too dynamic and its own plans uncertain.

"If you can't write the specifications for something, you can't outsource it," says Joseph A. Luppino, director of IS services at Kodak in Rochester, N.Y. "A lot of people are outsourcing this stuff specifically because they don't understand it, but that's fundamentally flawed."

But other companies, such as First Chicago Trust Co. in Jersey City, N.J., have turned over to outsiders all things Internet-related. First Chicago uses BBN Planet in Cambridge, Mass., to host and maintain its two Web servers and provide firewall security services.

First Chicago also outsourced the development and ongoing content maintenance for a Web service that lets registered shareholders vote the proxies of some of the company's clients that are authorized to vote electronically.

Functions that can be outsourced include Internet connectivity, Web server hosting, firewall security, World Wide Web site development and content development. According to Frank J. Casale, executive director of The Outsourcing Institute in New York, those are good candidates for outsourcing to the extent a company sees them as complex, subject to frequent change and not highly relevant to its core competencies.

But how do you make an outsourcing strategy work?

Sajoo Samuel, an assistant vice president at First Chicago, says he makes the total strategy work through close day-to-day management of the external relationships. "It's transparent to our end users," he says. "It appears to them that everything is taking place internally."

An internal project manager works with the outsourcers daily while serving as a liaison with internal business units, Samuel says. The project manager and outsourcer follow a schedule they have jointly committed to, he says.

## LOOK OUT FOR CHANGES

Eric Paulak, a senior analyst at Gartner Group, Inc. in Stamford, Conn., warns companies that have outsourced to multiple vendors to pay special attention to change management. "You have to have in place policies about who is going to manage the vendor and who will accept changes from whom," he says. "The biggest challenge is developing the process for managing this."

The Chicago Mercantile Exchange outsourced its Web hosting to BBN Planet and took several steps to ensure quality service, says Stephen Goldman, senior director of network services. The exchange wrote special monitoring software — running both at BBN and at its own data center — to ensure that real-time feeds are sent to BBN and are posted correctly.

Goldman advises paying special attention to contract terms. He says outsourcers come with boilerplate contracts, but customers can improve them by insisting on service-level guarantees that include details such as the amount of disk space to be devoted to the customer.

Playboy Enterprises, Inc. in Chicago outsourced Web

hosting but not Web site development or maintenance. "I feel very strongly about keeping content development in-house," says Eileen Kent, vice president of new media at Playboy. "No one knows your company and your products as well as you do."

Kent says she's "shocked at the poor quality" of some Web sites put up by outsourcers. "Managers sometimes just abrogate their responsibilities to a Web firm," she says.

## BE SPECIFIC ON PERFORMANCE

Kent recommends giving Web-hosting companies very specific performance goals. "You can say, 'My users are using 8.8 modems, and I want to be sure they can download this page in x seconds,'" she says.

But some experts caution against trying to write detailed specifications into contracts and recommend instead an emphasis on flexibility. Scope of services, performance metrics and prices should be defined with change in mind, says Robert Zahler, a partner and an outsourcing specialist at Shaw, Pittman, Potr & Trowbridge in Washington.

Zahler also advises against the long-term contracts common in traditional outsourcing deals. "There's no reason to make it longer than one year," he says. "Let the contractor earn his business."

Honeywell, Inc. employs a decentralized management style and until recently let its webmasters chart their own course in each of 95 countries. "There was this enthusiastic grass-roots effort, but it was uncontrollable, and it failed to satisfy any unifying strategy," says John Cochran, director of corporate identity and interactive media at the company's Minneapolis headquarters.

So Honeywell formed a 20-person global steering committee for the Internet. The group wrote everything from acceptable usage policies to standards for how the company logo should appear online. Outsourcers must adhere to those standards, Cochran says.

## SOUND MANAGEMENT

Experts say a wide variety of outsourcing strategies can work as long as sound management practices are applied. "The biggest pitfall we've seen in Internet outsourcing is in managing the underlying business function rather than anything unique in terms of technology," says Barry Weiss, an outsourcing specialist and partner at Gordon & Glickson PC in Chicago.

Because Internet technology and usage change so rapidly, Internet outsourcing is inherently unmanageable, says Bill Schallenberg, manager of Internet services at Marriott International, Inc. "It's a little by the seat of your pants in this industry," he says. "Sometimes you just have to do it and then come back and see how well you are doing."

Schallenberg says the way to manage Internet outsourcing is to pay a premium and go with the very best vendors. Marriott outsourced Web hosting to UUnet Technologies, Inc., which Schallenberg calls a "superb" company.

"You get what you pay for. I don't lose sleep about my server being down," he says. □

Antes is Computerworld's senior editor, special reports.

## COMPUTERWORLD

Want to learn more about outsourcing Internet functions? Look to our Web site ([www.computerworld.com](http://www.computerworld.com)).

## Outsourcing Pros and Cons

Sajoo Samuel, an assistant vice president at First Chicago Trust, ticks off the reasons most commonly given for Internet outsourcing:

- It's the fastest way to establish a robust Web presence.
- It's less expensive.
- It avoids the need to hire and train people with scarce skills.
- It's potentially more secure.

But the main reason large companies like outsourcing is the management time it frees up, says Eric Paulak, a senior analyst at Gartner Group. "If you have to worry about every [router] upgrade or software version 4-dot-whatever for your firewall, that just eats up time that could be spent designing your Internet environment or Web site," he says. "It's a productivity killer."

Chicago Mercantile Exchange officials say outsourcing Web hosting to BBN Planet has brought advantages and disadvantages. BBN offers superb security, network management and round-the-clock response to service problems, says Stephen Goldman, senior director of network services.

"But the biggest trade-off is the ability to react fast," Goldman says. "Our application developers would like to bring it in-house in order to be able to make changes faster."

Neil Pitts, manager of strategic infrastructure programs at Kodak — which hasn't outsourced any of its Internet activities — agrees that outsourcing can be constraining. But he acknowledges that outsourcing Web hosting would relieve Kodak of some management headaches.

"We host multiple geographical locations in the world. It requires us to manage all the interactions and links and firewalls, and that might be something we don't want to continue to do," Pitts says.

When Honeywell recently decided to redesign its corporate Web site, it decided to do it entirely in-house. And it's beginning to move its Web servers in-house from Internet service providers, says John Cochran, Honeywell's director of corporate identity and interactive media.

Cochran explains the retreat from Internet outsourcing this way: "Early on, when we were experimenting with the Internet, it didn't seem like something that ought to be a core competency for us. But we have now ascertained that the Internet is a strategic business tool for Honeywell and is deserving of significant resources and strong management."

If you're thinking about outsourcing Internet functions, consider the following factors:

- Outsourcing may make sense when:
  - A fast start-up is important.
  - Internet skills are lacking internally.
  - An outsourcer has better security arrangements.
  - You need high reliability and round-the-clock coverage and can't provide that in-house.
  - Outsourcing probably isn't a good idea when:
    - Your Internet services are of strategic importance and you demand maximum control over them.
    - Your Internet services are ill-defined.
    - You demand, and can provide in-house, rapid change to design and content.
    - You can do it more cost-effectively in-house (you have excess capacity). — Gary H. Antes



On April 18th  
we'll put their RAM  
to the test.

The sharpest minds in the computer industry today go head-to-head in a raucous game of ultimate computer trivia. The 1997 Computer Bowl, with celebrity host Robert Urich, April 18th at the Santa Clara (CA) Convention Center and The Computer Museum, Boston. All proceeds benefit The Computer Museum's educational programs.

T	H	E	?
C	O	M	P
U	T	E	P
B	O	W	L

Presented by Ziff-Davis.

Underwritten by Intel and Bay Networks.

Sponsored by ACM, Adaptec, Coopers & Lybrand, Kleiner Perkins Caufield & Byers, Silicon Valley Bank, Shiva, Mathsoft, and Stratus.

Test your wits now — play The Computer Bowl online at Internet Shopping Network, [www.ishn.com](http://www.ishn.com).

Sponsorship and seats are limited. Call now, 415 323 1909, browse [www.tcm.org](http://www.tcm.org) or e-mail, [allison@tcm.org](mailto:allison@tcm.org), for ticket or sponsorship information. The Computer Bowl contest is taped for broadcast as a special edition of PBS' "Computer Chronicle," airing the week of June 3rd. Check your local PBS listing.

# R E S O U R C E S : F O R I S M A N A G E R S

## BOOKSHELF

### Earned Value Project Management

By Quentin W. Fleming and Joel M. Koppelman  
Project Management Institute, Upper Darby, Pa.  
138 pages; \$24.95 (paperback)

Review by Jillian R. Wolleat

**M**ost project managers with formal project management training know earned value is what you get for what you spend. It's a three-dimensional "early warning" signal for management. Instead of the conventional actual cost vs. budget comparisons, it includes the dimension of relating the project's scope to the schedule and to the cost performance. It's the "budgeted cost of work performed," known affectionately as BCWP.

Fleming and Koppelman try to simplify this fundamental project management technique. They suggest "earned value for the masses," not just for the Department of Defense. They say project management techniques must be simple and easy to use or they simply won't be used. They're right.

A simple look at earned value is exactly what many project managers in private industry need. When I read the introduction, I thought this book would provide a cookbook approach to the use of earned value, with the authors presenting a project scenario that would show how valuable earned value is and how easy it is to use.

But it never happened. Instead, I got a great historical review of the use of earned value and a modest look at some other basic project management concepts and tools. The authors repeat im-

portant concepts numerous times, which helps confirm ideas to be remembered but is a bit irritating if you comprehend well on the first read. The essence of what is covered could have been done as well in half the number of pages. In some cases, reading the chapter summary is sufficient.

Most project managers will benefit from reading the introduction, Chapter 1 ("An Overview of the Earned Value Concept"), Chapter 5 ("Plan and Schedule the Project"), Chapter 6 ("Estimate and Budget Project Resources Within Cost Accounts"), Chapter 7 ("Establish the Project Baseline") and Chapter 8 ("Forecasting Final Cost and Schedule Results"). Beyond that, skimming other chapters and reading the summaries is probably sufficient.

**Wolleat, PMP, is founder of the Central Alabama Chapter of the Project Management Institute and a consultant for Computer Task Group in Atlanta and Birmingham, Ala. She can be reached at JWolleat@gtcig.com.**

### Managing Technical People: Innovation, Teamwork, and The Software Process

By Watts S. Humphrey  
Addison-Wesley Publishing Co., Reading, Mass.; 326 pages, \$24.69 (paperback)  
Review by Nick Maniaci

**I** there is one overriding management issue in the late '90s, it's recruiting, retaining and motivating talented technical professionals in an era of fierce competition and ever-diminishing resources.

Humphrey tackles this issue head-on. I liked his focus on how people's behavior can make a technical group successful. Many books have been written on how to obtain and enhance technical

skills, which are obviously important and would quickly lead to failure if not kept sharp. But Humphrey rightly argues that self-confidence, peer recognition and company respect are the chief factors that can improve performance. One particularly strong point: Money doesn't always drive high-performance teams. Peer recognition will go further.



Unfortunately, many of the examples Humphrey uses are based on his past experience at IBM, where for many years he was a senior software development executive. Readers would benefit from more current examples of companies (including IBM) that have dealt with the pressures of managing technical teams in highly competitive and downsized environments. If managers are to succeed (i.e., survive), they need to learn how to change their organizations quickly.

Humphrey provides no sample checklists that you can use to screen applicants or test for "creative" characteristics. If you're looking for a quick fix for your team, this isn't the book for you. But if you're a new manager or have been charged with rebuilding a technical group and have the time and luxury to implement some of his suggestions, this book will help you organize and manage a successful technical team.

**Maniaci is technical manager at GE Information Services. His Internet address is nickm@geis.geis.com**

## WEB SITE

### Strategy & Business

If you're a business leader (or a wanna-be), you might find some ideas and insight at this site, launched last month by Booz, Allen & Hamilton, Inc., the New York-based management consulting firm. The site is an extension of the quarterly publication sponsored by the firm. You can find book reviews, a listing of educational opportunities and recent strategy and business articles. Two articles from the first quarter discussed marketing lessons learned from the rock group the Grateful Dead and the rise of intranets.

Looking for a quote to help you with a speech or presentation? Click on the quotes page. The fourth-quarter list includes sayings from Adam Smith and Groucho Marx, among others.

## STRATEGY & BUSINESS

sponsored by BOOZ ALLEN & HAMILTON

Welcome to Strategy & Business, the leading publication for today's and tomorrow's business leaders. This is an extension of the U.S.-based publication.

Our mission is to help you sharply focus your agenda and put the best business ideas to work.



Strategic Initiatives  
Leading educational opportunities



Strategic Initiatives  
Leading educational opportunities



Strategic Initiatives  
Leading educational opportunities

## Upcoming Conferences

Got time for work-related travel? Try these selections that were previously listed as Hot Happenings for April:

**The AIM '97 Conference**, April 14-17 at the Jacob Javits Center in New York, includes 110 sessions and 350 exhibitors in the field of document and information management. Look for exhibits on groupware and data warehousing, among others. Contact: The Association for Image and Information Management International (AIMI), Silver Spring, Md. (800) 477-2442 or (301) 587-8022; Web site: www.aimi.org.

**Internet Showcase 97**, April 27-30 at the Sheraton San Diego Hotel and Marina, will spotlight new technologies and products. Expect exhibitors to put their best foot forward: Product demonstrators must be senior executives. Contact: Jill Pendergast, (415) 577-2533; E-mail: jpendergast@upsidc.com; Web site: upsidc.master.com/conf/showcase.

## Need more choices?

**The 1997 International Information Technology Quality Conference**, April 14-18 at The Grosvenor Resort, just outside Orlando, Fla., will focus on management, project leadership and quality assurance. Contact: The Quality Assurance Institute, Orlando, Fla. (407) 363-1111; Web site: www.qaiausa.com.

**DCL's Internet Expo and Sales Force Automation Expo**, April 22-24 in Chicago. Internet Expo will show what the 'net, Web and E-mail can enhance your business. "Sales Force" aims to help improve your competitive edge and boost revenue. Contact: Digital Consulting, Inc. (DCL) in Andover, Mass. (800) 324-3376; Web site: www.dcl-expo.com.

## COMPUTERWORLD

Visit our Web site, [www.computerworld.com](http://www.computerworld.com), where you can find listings of upcoming events on the Events Calendar and Online Careers pages.

LEILANI ALLEN

# IN IT BUYING, LOOKING HONEST IS BEST POLICY



What do you do if you suspect an influential figure in your company of favoring a vendor that gave him gifts or junkets? How far should you go to check out your suspicions?

Those aren't questions just for special prosecutors and congressional committees. They are also for IS staffers and bosses.

IS departments control millions of procurement dollars, and it isn't unusual to have a junior manager or staff member making recommendations on extensive expenditures. With so much on the line, vendors may well offer inducements, from sporting-event tickets to expensive meals, travel and other goodies. Just where do we step over the line and take personal advantage from a procurement assignment? What about policies to prevent conflicts of interest?

Consider two cases, one involving investment activities and another the procurement process itself.

Alfred was a vice president at a large manufacturing company. As he neared retirement, he was concerned about how he would finance his golden years. He was put in charge of a project to bring imaging technology to the firm. After reviewing several vendors, he chose Company X to be the exclusive supplier. Company X wasn't quite a start-up but had recently gone public and was struggling to establish its long-term viability. It spared no expense in convincing Alfred it was the right vendor, flying him to its headquarters and wining and dining him whenever its officials were in his town.

Alfred spoke glowingly of Company X and the project. But the plant manager had a different view. He didn't support the project, believed the technology didn't work as advertised and was unwilling to re-engineer his process to accommodate it. Alfred pushed back hard. Rumor had it that Alfred had invested

heavily in the imaging vendor and that his investment was motivating his advocacy of Company X. The CIO, believing that an individual's investment strategy is a private matter, didn't raise the issue with Alfred.

#### AT ANOTHER FIRM

Jerry was a manager in operations support, responsible for selecting the vendor to supply and support a major laptop purchase. The selection process was time-consuming and tedious, requiring long hours and involving multiple visits to vendor sites and reference installations.

#### Need some advice?

Are you perplexed by a management problem — or a problem with a manager? Pass it along to Leilani Allen via E-mail at [allen@tenex.com](mailto:allen@tenex.com). She'll answer questions in print and protect confidentiality if you wish. But be sure to include your name, address and telephone number for verification.

The vendors had agreed to pay Jerry's expenses during this due-diligence phase. Managers at Jerry's company had no problems with that.

Jerry's vice president discovered through a confidential source that Jerry was taking his new wife on trips sponsored by Vendor Y and that the trips frequently stretched across weekends. Company policy allowed employees to take their spouses on trips as long as it wasn't at company expense. Besides, the vice president sympathized with the personal

situation. When the recommendation came out in favor of Vendor Y, the vice president scrutinized the document carefully. But he could find no evidence of bias, believed the recommendation was reasonable and concluded there was no harm done. As a result, the vendor that sponsored Jerry's post-honeymoon weekend getaways got the contract.

**Judgment call:** Alfred and Jerry may have thought they rendered objective opinions. But a third party, such as a losing vendor, might well question the degree to which their personal well-being influenced their judgment.

Both cases show that companies need clear-cut policies that apply to anyone engaged in procurement decisions, from the staff member who does the analysis to the senior executive who signs the contract. Such policies protect the individual as much as the firm. Prohibiting investment in potential vendors is too extreme, and forcing employees to disclose their investment portfolios is probably an invasion of privacy. But individuals should be asked to disclose any financial interest in firms under consideration and to affirm that such investments in no way influence their decisions. Travel and entertainment can easily be abused, and vendor expenditures in that area should be constrained. For example, meals should be less than \$100, travel expenses should cover only the employee and be limited to weekdays, and gifts exceeding a value of \$50 should be prohibited.

Absent a corporate policy, the IS executive should establish a policy for the department and make potential vendors aware of it. If a manager hears rumors of impropriety, a reminder about the policy is appropriate.

Any appearance of impropriety or any question that a purchasing decision was made based on personal advantage rather than the merits of the case undermines the entire selection process and compromises the integrity of IS as a whole. And that can't be tolerated. □

*Allen's column deals with the kinds of people issues that managers face every day but are reluctant to discuss openly. Each column is based on real-life situations. The names and certain circumstances are changed to protect confidentiality. Allen is a director at Tenex, a management consulting firm in Burlington, Mass.*

## Pushing data to the top

If you work for a small company, there's a one-in-three chance your CEO doesn't spend enough time tracking key business information, a new survey indicates.

Sales, cash flow and accounts receivable are some of the data that isn't being monitored sufficiently by companies with annual sales of \$1 million to \$50 mil-

lion, according to the Coopers & Lybrand study of the top executives at 428 such firms.

But the survey indicates that small-company CEOs may be more technically savvy than their brethren at larger companies. Coopers found that more than two-thirds of the CEOs use a computer to track information.

And by a nearly two-to-one margin, those CEOs prefer using a desktop computer to a laptop or notebook to track data.

The 428 firms, Coopers says, were identified in the media as the fastest-growing U.S. businesses over the past five years.

"A large majority of the CEOs are becoming technically literate," says David Grand, a Coopers partner who specializes in fast-growing, high-tech companies. "I think they're

being forced to."

Brian Brumit, a director in the professional services firm's advisory business services division, says PCs are the "primary driver" in harnessing data for those companies.

Grand says it's important for a CEO to meet with his or her top IS manager and evaluate the "critical" data the CEO needs to run the business — and to have the data easily accessible.

— Rick Saia

**f.y.i.**

Flexibility. Security. Speed.

Once again, Microsoft combines and delivers the most advanced systems available for your business connectivity. Made to extend the life of current AS/400 and mainframe investments,

Microsoft® SNA Server 3.0 combines the familiar user interface of desktop PCs with the flexibility of LAN systems to offer PC users reliable and secure access to IBM host computing. Whether you use AppleTalk, Banyan Vines IP, IPX/SPX, or TCP/IP, your communications are integrated and linked with ease.

# It's Business Not Hopscotch

For more information on PC to AS/400 connectivity, call Microsoft at 1-800-426-9400 or check us out on our Web site at [www.microsoft.com/sna/](http://www.microsoft.com/sna/).



**Microsoft**

© 1997 Microsoft Corporation. All rights reserved. Microsoft is a registered trademark of Microsoft Corporation. [www.microsoft.com/sna/](http://www.microsoft.com/sna/)

# HOW DID WE BECOME A LEADER IN FAST ETHERNET HUB TECHNOLOGY IN JUST A YEAR?

- A) ENGINEERING GENIUS
- B) SUPERIOR PRODUCTS
- C) CAFFEINE
- D) ALL OF THE ABOVE

The answer, you might have guessed, is "d." Compaq is

pioneering Fast Ethernet technology and making mass migration

from Ethernet to Fast Ethernet simply effortless with a number

of industry firsts. With the first dual speed 10/100 hub, you can

forget about all those costly trips to the wiring closet. And

the first segmentable, stackable 100 Base-T hub nestles com-

fortably into your current network and delivers drop-in Fast

Ethernet access to your server. Now you can overcome cable

distance limitations with the only standard-based solution,

Smart Uplink. Ultimately, with Compaq Netelligent, you'll

benefit from the broadest range of products that are reliable,

affordable and offer the greatest price:performance. To learn

more, visit us at [www.compaq.com](http://www.compaq.com) or call 1-800-544-5255.



But hurry, because in business these days,

it's survival of the fastest.



*The Compaq Netelligent family of hubs:*

1108 8-Port 100 Base-T Unmanaged, 3612 12-Port 100 Base-Tw/Fx, 2624 100 Base-T Managed

**COMPAQ**

Has It Changed Your Life Yet?

## Buyer's Guide

**PRODUCT REVIEW:** We tested a dozen browser enhancements and identified six you just gotta have.

# PLAYING WITH PLUG-INS

BY ROSS M. GREENBERG

## A plethora

of browser plug-ins is available to help you tap the Internet's wealth of multimedia options, including video, sound and virtual reality. Equipping your home page with multimedia data that requires a plug-in in order to be viewed can give it an extra zing. But there is a downside: Some plug-ins are difficult to install and use and may force surfers to wait. Plug-ins are mini-applications designed to supplement your browser. But some plug-ins have ballooned into entire applications with mini-operating systems and programming languages that require users to wait and wait while they download and set up a required plug-in.

The list of plug-ins is growing. Twelve are featured here, but there are more than 100 available. Using the catalogs of plug-ins available at [www.browserwatch.com](http://www.browserwatch.com) and [www.stroud.com](http://www.stroud.com), among other sources, we singled out plug-ins we considered worthy of notice for corporate users. They have been separated into two categories:



**GOTTA-HAVE PLUG-INS** — ones you'll need as you surf the World Wide Web, because you'll run into pages that require them or because your own home page will benefit from their use; and **WANNA-HAVE PLUG-INS** — ones that will make your browsing easier, or at least more enjoyable, but aren't essential.

Unless otherwise noted, plug-ins are compatible with both Netscape Communications Corp.'s Navigator plug-ins and Microsoft Corp.'s ActiveX controls.

**TECH NOTE:** Netscape plug-ins are specially constructed Dynamic Link Libraries that reside in the `programs/plug-ins` directory of your Netscape folder. You can find out which plug-ins you've already installed in Netscape by clicking on Netscape's Help and About Plug-ins menu items. A plug-in can call any program on your disk, so it can be as destructive or malicious as a virus or Trojan program. Make sure you know who is giving you the plug-in.

Microsoft's Internet Explorer plug-ins are ActiveX controls, or files that end with an `.OCX` extension. They can reside anywhere on your disk but tend to be in the Windows directory or one of its subdirectories. It is easy for ActiveX developers to authenticate their control so you know exactly who wrote it and that what you got is exactly what they wanted you to get. That verification is one of the advantages of ActiveX controls; other plug-ins can't be automatically authenticated before installation. Don't run unauthenticated ActiveX controls unless you know the source of the control well enough to entrust them with the well-being of your data.



Plug-ins, page 82

# PLAYING WITH PLUG-INS

GOTTA-HAVES

CONTINUED FROM PAGE 81

## PLUG-IN: ScriptActive

COMPANY: NCompass Labs, Inc.

WEB SITE: [www.ncompasslabs.com](http://www.ncompasslabs.com)

PLUG-IN LOWDOWN: Allows Navigator to run ActiveX controls, which previously were reserved for Internet Explorer.

PROS: You are no longer tied to Internet Explorer for cool ActiveX stuff.

CONS: You can never be immediately up to date with a change in Internet Explorer; some pages may not work correctly without conversion.

PRICE: Free.



**TIRED OF PLAYING** the Internet Explorer vs. Navigator game? But you really like those cool ActiveX controls your buddy in the next cubicle runs? Well, download the ScriptActive plug-in now. Make sure you take a look at Microsoft's

ActiveX gallery. On it, you'll find some NCompass examples of pages using ActiveX controls that let Navigator work like a champ — but only when this plug-in is loaded. Unfortunately, you'll also find that controls on some pages simply don't work yet because page designers didn't properly install the required HyperText Markup Language (HTML) tags for ActiveX. NCompass produces a debugging tool and conversion program for those pages.

## PLUG-IN: Clear Video/Clear Fusion

COMPANY: Iterated Systems, Inc.

WEB SITE: [www.iterated.com](http://www.iterated.com)

PLUG-IN LOWDOWN: Enables supercompressed video files playing on a streaming basis for unusually speedy download.

PROS: The compression ratio makes videos, even QuickTime files, small enough to download painlessly. Adds quality video to your site.

CONS: There aren't that many sites using the compression/decompression (Codec) technology that you need to take advantage of it yet.

PRICE: Client plug-in is free. Encoder costs \$395.

**ASK ANYBODY WHAT THEY HATE** most about the Internet, and there's a good chance they'll say they hate to wait when they hit a link to a great video. Likely, when they see the video taking up a megabyte or so, they avoid it. Now that wait can be over with the amazing Codec technology inherent in Iterated Systems' Clear Video, especially when combined with Clear Fusion's streaming capabilities that start playing the video when you click on an .AVI video file. One example Iterated provided showed a 152-M-byte "raw" video working flawlessly when compressed to a mere 800K bytes. The installation package includes a plug-in for putting Iterated's technology onto QuickTime .MOV files; if you've avoided getting QuickTime, your excuses are now null and void.

WANNA-HAVES

## PLUG-IN: Carbon Copy Net

COMPANY: Microcom, Inc.

WEB SITE: [www.microcom.com](http://www.microcom.com)

PLUG-IN LOWDOWN: Allows remote control and buddy system of a remote machine also running the plug-in.

PROS: Great for technical support, remote problem solving and training.

CONS: Bandwidth problem, because graphics must be sent from slave system to master system, which can be slow on a slow modem connection.

PRICE: Free five-minute evaluation. Purchase: About \$60.

### AVAILABLE FOR BOTH Internet Explorer and Navigator, Carbon Copy plug-ins make it easy for you to manipulate and manage a remote browser. The free plug-in is restricted to running within your browser window, but it also

allows full access to the remote machine. It's so transparent that you can do dangerous things, as shown by the number of hackers trying to crash Microcom's demonstration sites. But there's adequate security available in the plug-in, and it's easy to install and use. Using dial-up networking remotely through Carbon Copy is an eerie experience. Try it, and you'll be hooked. I had some problems with the remote machine, which was seemingly stuck in a screen full of logos at times, but that happened only when connecting to Microcom servers during the evaluation period. You get only a few minutes to experiment with the free version, though.



## PLUG-IN: QuickView Plus

COMPANY: Inso, Inc.

WEB SITE: [www.inso.com](http://www.inso.com)

PLUG-IN LOWDOWN: View data files in their native format without having the application. Print them, too.

PROS: Very effective set of plug-ins for viewing virtually any file; great for file transfer protocol downloads and for sending out read-only documents.

CONS: Each of several QuickView Plus plug-ins is loaded when you start Netscape, which slows down initial loading. Not every viewer you might need is available.

PRICE: 30 days free, then \$60.



**YOU ALREADY HAVE QUICKVIEW** on your machine. It comes pre-installed with Windows 95. Select a file, right-click on it, and you'll see QuickView. Its big brother, QuickView Plus, has more viewers for more file formats generated by more applications. With it, you can view files such as CorelDraw .CDR files, even if you don't have Corel. The plug-ins handle about 200 formats. For Netscape fans, each viewer has its own plug-in; a single module can contain multiple viewers. Each plug-in must be loaded and initialized as Netscape starts, so if you never noticed Netscape showing you a message that said "loading plug-ins," you will after you install QuickView Plus and wait an annoying extra few seconds. That problem doesn't exist with Internet Explorer: A single ActiveX control gets loaded and processes files as required.



## PLUG-IN: Ichat

**COMPANY:** Ichat, Inc.

**WEB SITE:** [www.ichat.com](http://www.ichat.com)

**PLUG-IN LOWDOWN:** Provides a full Internet Relay Chat (IRC) client within a browser, using public or private servers.

**PROS:** Chat capabilities can exist natively on your Web page for technical support and company "events."

**CONS:** Public chats can be quite a time sink, and IRCs are never an efficient means of communication.

**PRICE:** Client plug-in is free. Ichat rooms costs \$40 per simultaneous user.

**IRC IS AN EFFECTIVE**, albeit not terribly efficient, means of communicating to either a small group of people, perhaps working in collaboration on a project or with a large group that needs to experience a corporate event. The Ichat server software is fully scalable. Its price is based on how many simultaneous users can be supported: America Online used Ichat for a 17,000-member chat with Michael Jackson. Providing moderated chats for technical support and for real-time announcements about your Web page is cool these days. Because the client is free, test their public server to see what IRC is like — it might be something your users need and might give them a sense of community.



## PLUG-IN: Acrobat Reader

**COMPANY:** Adobe Systems, Inc.

**WEB SITE:** [www.adobe.com](http://www.adobe.com)

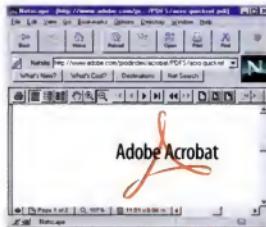
**PLUG-IN LOWDOWN:** Display popular, rich .PDF documents in the browser in this streaming display plug-in.

**PROS:** For consumers, .PDF files are springing forth all over. This plug-in lets you read them. For producers, Acrobat allows for the creation of some magnificent functional documents.

**CONS:** .PDF documents are big, and therefore, generally slow to download.

**PRICE:** Client plug-in is free. Stand-alone editor is \$295 (site licenses available).

**PLATFORM INDEPENDENCE** is the Holy Grail of computing. With the Web's HTML and style sheets, it's getting closer. But nothing on the Web could look exactly like your Word document laden with hyperlinks, graphics and different fonts until Adobe's Acrobat Reader showed up. This free plug-in appears to have seamless integration to the full reader application and can compose those spiffy documents. There's an ActiveX control, too. The reader is greedy for CPU cycles once its streaming ability kicks in; it isn't a particularly well-behaved Windows 95 application — it doesn't appear to relinquish control often enough. Your browser — your system actually — will appear sluggish during download. Because .PDF files tend to be large, that might annoy you. But the quality of the downloaded and displayed document will astound you.



## PLUG-IN: Hindsite

**COMPANY:** ISYS/Odyssey Development, Inc.

**WEB SITE:** [www.ysisdev.com](http://www.ysisdev.com)

**PLUG-IN LOWDOWN:** Indexes the full content of each page visited then gives an easy query agent for fast lookups.

**PROS:** Very useful for Web surfers who need to visit several sites previously visited but not bookmarked.

**CONS:** None.

**PRICE:** 90-day free evaluation, then \$40.

**WE ALL HAD** the "Ah-ha!" experience of discovering something that complicates your life dramatically. Add another one to the list with ISYS' Hindsite plug-in/program. Using the simple idea that your browser's cache already has all the pages you've visited for speed access, Hindsite takes advantage of that and indexes everything on each visited page. It then gives an intelligent query agent to quickly search that index with Boolean logic, if desired. As your cache

fills up and immediately before a page drops out to be replaced with another fresh page — the soon-to-be-flushed page is automatically added to Hindsite



site's index. Unobtrusive but ever vigilant, the index doesn't grow too large. And because it's local, it's faster than a speeding bullet. Using Hindsite could easily make Add Bookmark a thing of the past. For a user who does a lot of Web surfing, this plug-in is more than just an option.

## PLUG-IN: History Tree

**COMPANY:** SmartBrowser Corp.

**WEB SITE:** [www.smartbrowser.com](http://www.smartbrowser.com)

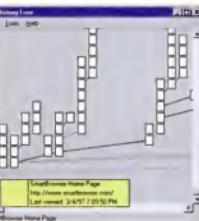
**PLUG-IN LOWDOWN:** Presents a graphical representation of all sites visited in a tree format, showing temporal relationships and links.

**PROS:** Eases use of the Web, in essence, a point-and-click interface to all sites visited.

**CONS:** None.

**PRICE:** \$10 (shareware).

**START OFF AT ONE SITE**, and a half dozen clicks later you're someplace you never dreamed existed. It's the right site, but you saw some interesting sites along the way. How did you get there, anyway? If you're using History Tree, that needn't be a worry. Each site you visit will have a uniform resource locator (URL) stored in a graphical tree, with the relationship of your visit to each site shown for you to visualize. As you pass your cursor over a member of the tree, its URL, last date and time you visited and the title (if any) of the page will pop up. Click on a leaf of the tree and your browser takes you there. You can even do a thumbnail screen capture to pop up as you look over the landscape you've blazed. History Tree is unobtrusive, powerful and simple to use — five minutes after you start using it, you'll be wondering how you ever lived without it.



Plug-ins, page 85

# Have You Gathered Mountains of Data?

On April 21, Learn How to Turn that Data into Knowledge at the

## Data Mining Face-Off

Fairmont Hotel in San Francisco, CA

April 21, 1997

If you're a CEO, CFO, CIO, or Senior IS professional, or if you need the process of data mining demystified, plan to attend this full-day event. Learn how to predict future trends and customer behaviors by manipulating data. Learn about the newest tools available in data mining today.

### What's Different About This Seminar?

The format. It's a face-off, an interactive discussion between vendors...and YOU. Data mining experts from DataMind Corp., HyperParallel, IBM, NCR Corp. and Torrent Systems—the big guys and the little guys—will present responses to the same RFPs so you can see how different vendors approach and solve the same problem. Then the fun part begins...discussion, debate, audience participation. At the Data Mining Solutions exhibits, you'll have a chance to talk one-on-one with these vendors about your organization's particular challenges.

### Presenters

Data mining experts from the leading vendors in the industry present solutions to today's complex business challenges in a comparative setting that promises to deliver real answers to real business problems. While RFPs in both the retail and finance industries are the focus of the presentations, these experts will entertain questions from the audience as well as each other to make this day a lively, interactive experience.

### Accommodations

Reserve a room at the Fairmont Hotel and benefit from a reduced group rate. Just mention the TBI Data Mining Face-Off when you call 800-527-4727 for reservations and information.

### Register Today

Don't delay in registering for this exciting full-day event on data mining solutions. The event fee is \$150, and \$125 for each additional attendee, payable by check, money order, VISA, MasterCard or American Express. Fax your registration with credit card information to 201-573-9191. Mail your registration with money order or check payable to Technology & Business Integrators, to TBI, 50 Tice Boulevard, Woodcliff Lake, NJ 07675. If you have questions, or prefer to register by phone, please call 800-676-9470, ext 11.

## Agenda

8:15 Continental Breakfast  
8:50 Opening Remarks  
9:00 Data Mining Presentations - Retail Industry  
10:30 Refreshment Break  
11:00 Vendor Debate - Retail Industry  
12:00 Close of Morning Session  
12:15 Hot Buffet Lunch  
2:00 Data Mining Presentations - Finance Industry  
3:30 Refreshment Break  
4:00 Vendor Debate - Finance Industry  
5:00 Closing Remarks

Data Mining Solutions exhibit area open for viewing of product demonstrations throughout the day during breakfast, scheduled breaks, lunch, and after closing remarks until 6:00 pm.

### Event Sponsors:



YES, I will attend the Data Mining Face-Off on April 21, 1997 at the Fairmont Hotel in San Francisco for an all-inclusive fee of \$150.

Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Phone \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_

Bring along a guest for \$125

Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_

Payment Method:  VISA  MasterCard  American Express  Check or Money Order

Credit Card Payment - Fax your registration with credit card information to 201-573-9191

Credit Card Number \_\_\_\_\_ Expiration Date \_\_\_\_\_

PRINT name as shown on card \_\_\_\_\_ Signature \_\_\_\_\_

Check or Money Order Payment - Mail your registration and payment to: TBI, 50 Tice Boulevard, Woodcliff Lake, NJ 07675

Please make your check payable to Technology & Business Integrators.

QUESTIONS? Call Les Goldman at 800-676-9470, ext 11, or email: [lgoldman@tbcentral.com](mailto:lgoldman@tbcentral.com)

Participating Vendors:

**DataMIND**



**IBM**

**NCR**

**Torrent**

# WITH PLUG-INS

GOTTA HAVES

CONTINUED FROM PAGE 83

## PLUG-IN: RealPlayer

**COMPANY:** Progressive Networks

**WEB SITE:** [www.real.com](http://www.real.com)

**PLUG-IN LOWDOWN:** Provides the ability to stream video and audio on your browser.

**PROS:** Great for presentation video and/or audio publicity on your Web page.



**CONS:** Canned audio or video presentations can be a hefty download, are bad for server bandwidth and expensive when producing quality audio and video promotional.

**PRICE:** Client plug-in is free. Server for live audio/video starts at \$600 for five users.

**STREAMING VIDEO** has been added to streaming audio in Progressive Networks' RealPlayer plug-in. That means nearly immediate sight and sound as soon as a URL is clicked, even on a large multimegabyte .AVI file. The demonstrations available on the company's home page include three short films by director Spike Lee, which gives you an idea of what can be accomplished. With the advent of "push" technology, I can see companies announcing the equivalent of blue-light specials for their customers.

WANNA HAVES

## PLUG-IN: Flash (formerly FutureSplash)

**COMPANY:** Macromedia, Inc. (formerly Future Wave)

**WEB SITE:** [www.macromedia.com](http://www.macromedia.com)

**PLUG-IN LOWDOWN:** Plays .SPL (Splash) "smart" animated files with full streaming vector graphics. Surprisingly fast and small.

**PROS:** Very small player (80K); great for both Internet Explorer and Netscape and makes viewing stunning graphics easy and painless.

**CONS:** None.

**PRICE:** Free. Editor costs \$249.

**FLASH'S PLUG-IN** allows shockingly fast, surprisingly small and amazingly functional files to be part of your Web page. You get pages that can do stuff such as active buttons that let different actions take place when your mouse cursor is away from, near or clicked on the button. The plug-in is free; the package to create the Splash pages is available for a 30-day evaluation from the company's home page.



## PLUG-IN: Shockwave

**COMPANY:** Macromedia, Inc.

**WEB SITE:** [www.macromedia.com](http://www.macromedia.com)

**PLUG-IN LOWDOWN:** Shockwave files are usually active pages that this plug-in will display and play.

**PROS:** Shockwave pages let you display active pages that can go considerably beyond normal HTML in functionality and appearance.

**CONS:** The plug-in is large. Surfers might bypass your page rather than take the time to download the plug-in.

**PRICE:** Client plug-in is free.

**ALONG WITH THE SERIOUS BUSINESS** uses for this plug-in, which lets you create some stunning and functional Web pages, there's the amusing uses. Try to save the White House from Godzilla or play professional-level Whack-A-Mole. Both are staff picks from Macromedia's Shockwave Gallery. The Reader/Viewer is a freebie, but the ability to create "shocked" pages requires pretty sophisticated — and expensive — software. Invest your time and download the plug-in and/or the control. What you'll get back immediately is the ability to display CD-quality streaming audio and vector graphics. □



## PLUG-IN: VoxChat and ToolVox

**COMPANY:** Voxware, Inc.

**WEB SITE:** [www.voxware.com](http://www.voxware.com)

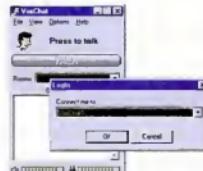
**PLUG-IN LOWDOWN:** VoxChat is an Internet telephony product that provides for voice chats among multiple simultaneous users. ToolVox is a voice component tool box suitable for Web pages.

**PROS:** Brings Internet telephony up to the level of party-line-style conferencing. Great for technical support or collaboration. VoxChat provides capabilities unheard of before in voice-on-the-Web technology.

**CONS:** "Press to Talk" technology feels backward.

**PRICE:** VoxChat is in beta (server will likely be priced on per-user basis).

**VOXCHAT ENTERED BETA** the first week in March. It's not ready for prime time, but it's certainly a corner and definitely a keeper. It's sorta cool. After downloading the plug-in, a single HTML line in a Web page will cause a voice chat system to pop up, with optional private rooms. Up to four people are able to participate in an intercom-like way. Currently using Voxware servers, it's probable that the server software will be for sale soon. Even more smashing is Voxware's ToolVox: a set of plug-in tools easily accessible from your Web page and controllable by simple JavaScript commands. Download ToolVox, install it and hear John Kennedy's famous "Ask not" speech in a 7.8-K-byte file. That's about four minutes of a most powerful speech, downloadable in only half a minute. That's a helluva Codec. □



Greenberg is a reviewer and developer in New Kingston, N.Y.



## In Depth

## SEARCH

The original  
Computer  
Emergency  
Response Team:  
part SWAT  
team, part  
therapist

AND  
RESCUE

**Late on a rainy Friday afternoon,** just as the technical staff at the CERT Coordination Center is getting ready for the weekend, the hot line rings. It's a systems administrator at a hospital who suspects a virus attack in progress.

In a flash, the atmosphere in the Computer Emergency Response

Team's (CERT) locked-down offices turns from jovial to deadly serious.

"That's a life-threatening situation. We drop everything else right then," says Kathy Fithen, manager of this CERT's daily operations and also its captain. "As soon as we hear it's a medical facility, we know people's lives could be at risk, so we respond."

For the next four hours,

CERT works to identify the virus, determine the damage and get the hospital in recovery mode. One person stays on the telephone with the hospital. One logs on to the World Wide Web, looking for information and tools. Another hits the phones, calling colleagues at myriad virus associations and help desks.

The hospital initially suspects the virus has at-

tacked only one server, but the team discovers the virus is actually altering and deleting files on several servers at related health care centers in different cities.

"You never know when something big will explode into something much bigger," Fithen says. "That's part of the stress."

Search and rescue, page 88

# SEARCH AND RESCUE

CONTINUED FROM PAGE 87

Housed in the glass-and-chrome Software Engineering Institute at Carnegie Mellon University in the Oakland section of Pittsburgh, the CERT Coordination Center is the granddaddy of all CERTs. Its hot line is the outgrowth of a 1988 move by the U.S. Defense Advanced Research Projects Agency to put a single centralized team in charge of monitoring Internet security.

Incident reports have ballooned since then, from roughly 400 the first year to 2,300 last year, and some 50 other CERTs have emerged worldwide.

Fithen's crew members are fixed on the day when they put themselves out of a job — when Internet and corporate network security are so robust the CERT

For example, it's been widely known for at least a year that Common Gateway Interface scripts — which are used at Web sites to support features such as ordering forms and surveys — can be easily exploited. But the CERT Coordination Center continues to hear from users who were compromised because of them.

Similarly, sendmail, the Unix message-routing software that is common on the Web, is known to be extremely vulnerable. Nevertheless, Zajicek recently saw a Web site that proudly described its entire software infrastructure — including a notoriously buggy version of sendmail. "That's like saying to an intruder, 'Don't go over there, the money's over here,'" he says.

#### THE CERT QUANDARY

The conflict between the responsibility to report known security hazards and the reticence to place information in the wrong hands constantly gnaws at those in the CERT program.

While team members are interested in creating a public dialogue about known vulnerabilities and preventive measures, they are loath to speak of them in detail. For example, the team posted a sendmail advisory on Jan. 28 only after incident reports had been streaming in for some time.

The CERT Coordination Center's Vulnerability Reporting unit methodically decides which advisories to release and when, using a spreadsheet that balances the public good with intruders' interests. The team painstakingly crafts advisories to be useful without revealing clues that would aid attackers. The advisories are cross-referenced and linked at myriad Web and file transfer protocol sites on the Internet. Patches are available for each posted vulnerability.

Despite all the CERT's deliberation, caution and thoroughness, the warnings go unheeded. Buggy software remains unchanged by IS and vendors alike. This is frustrating but not surprising.

CERT staffers say. They say today's systems administrators are novices in an arena that's expanding faster and in more directions simultaneously than any technology in history.

Under pressure from senior management to get on the Web, systems administrators routinely add software and hardware to their networks that create ideal entry points for intruders. Given the plug-and-play aspects of distributed computing, users forge ahead with blind faith that vendors have incorporated built-in security.

"The 'net is crawling into so many areas of our lives," says Georgia Killce, a CERT technical staffer. "There's this population of people who just aren't security-aware." Zajicek agrees. Every day, he says, when he reads electronic mail, "I'll get that 'oh no' feeling in the pit of my stomach. Because we've dealt with the same problem so many times, you can actually predict how things will go before you speak to the site."

## "You never know when something big will explode into something much bigger." — Kathy Fithen, CERT Coordination Center

won't be necessary.

Ask them when that day will come, however, and they laugh giddily.

Gallows humor is how team members deal with high-stress jobs that they never leave far behind. The stress is so high, in fact, that the seven people on the team comprise the equivalent of only five full-time hot-line workers. They rotate through periods of administrative, research and education responsibilities to avoid the burnout that would inevitably come from constantly handling calls.

The team fielded 2,062 hot-line calls last year. It responded to incidents involving thousands of hosts that ranged from plain-vanilla break-ins to root system compromises to attacks on the Internet infrastructure, which receive top priority along with life-threatening incidents. Last year's calls were down significantly from the hot line's peak of 3,664 calls in 1994. But reported incidents rose to 2,573 last year from 2,341.

"Fewer intruders are succeeding, but the number of attempts is increasing," says Mark Zajicek, a member of CERT's technical staff. "Even if only 10% to 20% of the attempts succeed, that's a lot."

#### THE SORROW AND THE PITY

The team gets the hospital on the path to recovery within four hours, largely because the virus is well-known, so tools are available online to cure it and restore operations. That underscores the frustration — and irony — of their jobs. While there are known preventions for the overwhelming majority of the breaches that prompt hot-line calls, information systems managers and systems administrators often are unaware of them.



In its annual report, the CERT Coordination Center outlines the problems it saw most frequently last year. "Unfortunately," the report states, "we continue to see the same problems in 1997."

#### Here are some recent favorites:

cgi-bin/phf. Hackers snare password files through a vulnerability in the phf.cgi-bin script. Last year, attackers usually went bobbing for the server's /etc/passwd file. CERT reports. Sample scripts used to execute this con are widely available on the Internet. Word is spreading, the report adds, and many attacks now fail because sites have removed the phf program. Naturally, though, the hack is "still being widely attempted."

Linux. "We saw an increase this year in break-ins and root compromises of Linux machines," CERT reports. Most intrusions were achieved through long-known and well-documented vulnerabilities.

Denial-of-service attacks. The Web is teeming with how-to-manuals on executing denial-of-service attacks, complete with scripts. That may help explain why such attacks grew in popularity last year.

Hackers create "TCP half-open connections," CERT reports, through Internet Protocol spoofing. The data structure of the victim's sever fills up, and the system stops accepting new, incoming connections.

If your taste runs to oldies, here are some common invasions that date back to at least 1995 and show no signs of letting up: "attacks on known vulnerabilities," packet-sniffers that collect account names and passwords, IP spoofing and, of course, sendmail attacks (see story above).

Repeat callers are the most disconcerting, the team says. After all the work the CERT puts in to an incident, many users still don't follow through.

Fithen recalls the following example: CERT had advised an Internet service provider that had been compromised to take its server off the network, determine what changes the intruder had made, restore files and assign new passwords. The service provider complied for the most part — but left the server connected. Internet service providers "always say their server is too critical to take down," Fithen explains. "But if you don't, you don't know if the intruder is still doing damage while you're making the fixes."

The punch line is predictable: "Of course, they called back," Fithen says. "Now everything had been deleted. The problem was a lot worse than it had been before."

#### PIPE DREAM

Outside, cold rain turns to icy snow. Things are slow. Several team members wander the glass-enclosed lunchroom for coffee. They sit in the otherwise deserted room and shoot the breeze.

"Every job has its frustrating times," says Larry Rogers, who researches and writes advisories for the Vulnerability Reporting unit. "We like to envision software developers doing more with the information that's available. And we hope that by educating users, we'll eventually put ourselves out of a job."

"That's pie in the sky," Fithen says. "You've got to have a goal," Rogers responds, smiling. □

Goff is a freelance writer in New York.

*Start your  
day...*



**COMPUTERWORLD**

*The online connection of information technology leaders*

**[www.computerworld.com](http://www.computerworld.com)**

## IT Careers

## PARTING THOUGHTS



When information systems managers leave the exit interviews to HR, they may lose their chance to gain valuable departmental insight: Why not pick the brain of a departing employee? / BY JILL VITIELLO

## IS: "Got to know!"

A FEW WEEKS AGO, Terry Hornbaker did something few information systems managers would do. He conducted an exit interview.

Hornbaker, director of reservations technology at Southwest Airlines in Dallas, says he views the process as a chance to get some straight talk from a departing IS professional. After all, people are more likely to discuss their real feelings openly as they sever their ties with the company. And he wants the information firsthand.

"I want to find out the reason for an employee leaving," Hornbaker says. "Usually it falls into three areas: money, technology and opportunity." How the employee answers tells Hornbaker whether there is a chance to change his/her mind. "When people resign for money or technology reasons, they're gone. If they're leaving because of a people issue or a responsibility issue, we look for ways to make them stay, possibly by providing new opportunities," he says.

Questions about access to new technology, methodology, project management and training opportunities may prompt the departing IS staffer to provide useful insights that Hornbaker might not otherwise discover.

Too often, it's the IS manager who misses an opportunity. Unless they conduct the exit interview themselves or work closely with human resources to develop IS-specific questions for the interview, IS managers may never gain actionable insights into what it's really like to work in the department.

When IS managers leave the exit interview process entirely to the HR depart-

ment, they're likely to get feedback on company policies and procedures. But they can expect little information that has a direct bearing on daily IS decision-making or long-term technology strategy.

By running the exit interviews himself, Hornbaker says he gets to ask questions that help him uncover communication and leadership issues.

Hornbaker has conducted about a dozen exit interviews during the past year, and he has convinced three employees to stay. He also shares the information he gathers from exiting employees with the HR department, which handles other formalities of employees' departures.

But be warned: Experts advise IS managers who have terminated employees not to conduct those exit interviews themselves. Instead, leave that to the HR department, which can better create an atmosphere of objectivity.

## Get more value from the exit interview

A good exit interview will yield information on department policies and procedures, employee morale and the abilities of individual managers. A great exit interview will add value in unexpected ways. Whether IS managers conduct the exit interviews themselves or give human resources experts questions to ask, Dana Milner suggests the following innovations for getting the greatest value from the interview:

- 1 Turn the interview into a recruiting opportunity. If performance wasn't an issue, ask departing employees to recommend good people to fill their positions. This is especially important for IS managers who are looking for professionals proficient in new technologies such as the World Wide Web and object-oriented programming. Many regions don't have an abundance of such specialists, and the good ones usually know each other.
- 2 Inquire about the company's reputation. Ask the exiting employee what they have heard about the company. Is it considered a good place to work? Is it responsive to employees' needs? How does the company's image compare to that of its competitors? Is it perceived as a technology leader or a laggard?

## HR: "Trust me!"

When IS managers work with HR employees that conduct exit interviews, they often get candid insights into the culture of their IS departments.

"The benefit of having human resources people doing exit interviews is that they represent an objective third party who is not the manager," says Dana Milner, a principal at Dana Milner & Associates in Fort Collins, Colo. Many IS managers concur with that view.

"If line management were involved with the exit interview, you wouldn't get open and honest answers," says John Anderson, vice president of telecommunications and computing services at APL Ltd., a cargo transportation company in Oakland, Calif.

IS employees who leave APL meet with Stephanie Rundin, manager of HR

systems, before they go. Rundin collects information from the exit interviews and looks for trends in departing employees' responses. Then she creates written reports and gives them to direct supervisors and every manager up the chain of command, right to the chief information officer.

"When people leave our company, they know up front who the information will be distributed to," Rundin says. "If they ask me to keep certain responses off the record, I honor their wishes for confidentiality on those matters."

Departing employees at APL may review the exit-interview report upon request. For some companies, conventional exit interviews are too time-consuming, but the information they yield is valued. Those companies find other ways to get it.

"The exit interview is more effective a few weeks after people have left," says Alan Bignall, vice president of systems development at American Express Financial Advisors. Bignall says the time lapse provided by offering a survey instead of an in-person interview before an employee leaves eases the pressure and can elicit more candid and thoughtful answers.

Beyond the usual reasons for accepting another job, such as money and opportunity, employees cite others, Milner says. Employees relocate, trail a spouse who has been offered a new job or retire.

For an employee who is fired, participating in an exit interview can be especially important to ensure that the employee's point of view is included in the personnel file. □

Vitiello is a freelance writer in East Brunswick, N.J.

# DASH for the CASH

Rising salary offers are creating mobility in the AS/400 workforce.

But more men than women are going for the gold.

**A**NYONE WHO HAS AS/400 skills is highly employable these days, but men are likely to be paid more for reasons that appear linked to gender rather than experience or education.

A new national AS/400 compensation survey indicates that women in AS/400, or midrange, shops tend to earn less, apparently because they are less willing to change jobs to obtain higher salaries.

Because of hiring shortages, salaries for all AS/400 professionals have continued to rise steadily. Annual raises average 5.7% for programmers/analysts and 7.7% for managers, says Nate Viall, president of Nate Viall & Associates, a consulting firm in Des Moines, Iowa.

Demand for AS/400 professionals is extremely strong in virtually all metropolitan areas, he says.

"Salaries are much higher now than they were even a year ago. And we just don't see any signs that it's getting anything but worse [for employers]," says Marc Cohn, senior vice president at Enterprise Rent-A-Car in St. Louis. "We've had to step up to the higher salary structure. The last thing we want is to lose good people over compensation."

Cohn says Enterprise hopes to hire

about 65 AS/400 professionals this year compared with about 80 last year.

For the first time since Viall began surveying AS/400 salaries several years ago, a salary gap has emerged that can be attributed specifically to gender, he says. Viall's survey is the largest one specific to the AS/400 sector.

Previously, when male IS professionals earned more than female IS professionals for various job positions, the differences usually could be explained by differences in experience and education.

But even taking those factors into account, Viall says there is a national gender gap in the AS/400 field. Men earn an average of \$1,500 to \$2,000 per year more than women. Gender gap salary differences were previously limited to the rural South, Viall says.

He attributes the AS/400 gender gap to the greater willingness — or ability — of male IS professionals to relocate for a higher salary. "In a rapidly rising market, a lot more males are taking advantage of the higher salaries being offered for people changing jobs," Viall says.

Carolyn Farris, a computer operations supervisor at Jimmy Dean Foods in Cordova, Tenn., says men command higher salaries than women in the AS/400 field. But the reason, she says, is that "a lot of

managers think men are breadwinners and that they require more money than women, which is not true."

Farris says even if men are paid more because they change jobs more often, it isn't justified. "That's no excuse for paying a stable employee, who works just as hard as a man, a lower salary," she says.

Many IS hiring managers say they haven't seen any pay differences that can be attributed to gender alone. Some say men are more likely than women to change jobs. "We get men who are interested in relocating their professional careers. Most women we get [want to move] here because their husbands found jobs in this area. I don't see that many women taking the lead in relocating," Cohn says.

"The truth is that women do not move as much," says Warren Fristensky, vice president of information technology and chief information officer at John Wiley & Sons, Inc. in Somerset, N.J., a publisher of technical books and journals. "They have children, they get married, or their husbands or significant others keep them in one location."

The gender gap varies by region. In December and January, a region that includes Minnesota, Wisconsin, Iowa, North Dakota and South Dakota had a \$2,100 gender gap for AS/400 programmers but none for AS/400 managers. For the same period, a region that includes Kansas, Missouri and Illinois reported no gender gap surrounding AS/400 salaries, Viall says.

The shortage also is creating higher salaries for less experience. A survey that Viall took last fall found that 20% of programmers who had five to six years' experience earned \$50,000 or more per year — a pay level that a few months ago had required seven to eight years experience.

Richard Kolbe, director of information services at Harley-Davidson, Inc. in Milwaukee, says, "Starting salaries in the Milwaukee area are now in the low to mid-\$30,000s. That used to be the salary for more experienced people." □

## MONEY FOR THE MASSES

AS/400 salaries are increasing the most at the lower job levels

POSITION	WINTER '96	WINTER '97	% INCREASE
Vice president, CIO	\$101,700	\$105,700	4%
MIS director	\$79,800	\$82,200	3%
Data processing manager	\$54,700	\$58,500	7%
Programmer/analyst (five to six years experience)	\$40,200	\$42,600	6%
Programmer/analyst (one to two years experience)	\$31,500	\$34,500	10%
Entry-level programmer/ analyst (four-year degree)	\$30,000	\$33,200	11%

Source: Annual AS/400 Salary Survey by Nate Viall & Associates, Des Moines, Iowa.



"In a rapidly rising market, a lot more males are taking advantage of the higher salaries being offered for people changing jobs."

— Nate Viall, president, Nate Viall & Associates

"The truth is that women do not move as much. They have children, they get married, or their husbands or significant others keep them in one location."

— Warren Fristensky, vice president of IT and CIO, John Wiley & Sons



## COMPUTERWORLD

Janice Litvin offers advice on crafting a top technology resume.

[www.computerworld.com/careers](http://www.computerworld.com/careers)

Alexander is a freelance writer in Edina, Minn.

## TOOLS FOR BUILDING AN OUTSTANDING FUTURE.



Scudder, Stevens & Clark, founded in 1919 in Boston, Massachusetts as the nation's first independent investment counsel organization, has more than \$115 billion in assets under management. Today, technology offers one of the best ways to deliver the outstanding products and services which our customers can use to build a strong and stable financial future. That's why we pride ourselves on maintaining an environment with the latest and best technologies and tools.

### OPPORTUNITIES IN INFORMATION TECHNOLOGY

- POWERBUILDER CLIENT SERVER PROJECT LEADERS & DEVELOPERS
- RELATIONSHIP MANAGEMENT CLIENT SERVER PROJECT LEADERS AND DEVELOPERS
- FOXPRO PROGRAMMERS
- DESKTOP SOLUTIONS CONSULTANT
- DATA WAREHOUSE DEVELOPER
- CUSTOMER INFORMATION FILE PROJECT LEADER
- META DATA MANAGER
- SYBASE/SUN DATABASE ADMINISTRATOR
- UNIX ADMINISTRATOR
- INTERNET PLATFORM SUPPORT ANALYST
- PEOPLESOFT BUSINESS ANALYST

At Scudder, we offer one of the most comprehensive benefit programs including health, dental, life and long-term disability insurance, 401(k) and profit sharing plans, and a tuition assistance program. Interested applicants, please forward your resume and salary requirements to:

Scudder Stevens & Clark, Human Resources - CW, Two International Place, Boston, MA 02110; Fax: (617) 295-4029; E-mail: karen.pallotta@scudder.com

We are an equal opportunity employer, committed to workforce diversity.

### Scudder, Stevens & Clark, Inc.



**Vision Solutions, Inc.** recently named one of the fastest growing private companies in the US is a Premier Business Partner of IBM and the world leader in the design, development and delivery of Object Monitoring Software for the AS/400. Our success is based on our superior products, technical innovation, responsive service and commitment to exceeding customer expectations. We invite the following qualified professionals to join us in our pursuit of excellence.



#### Account Executives (EA, NY, GA, MA)

We are looking for hard hitting account executives to help us expand our North American Sales team. You must be able to work independently and have at least 4 years successful sales experience in the IBM mid range market. If you qualify, you need consulting selling experience and previous experience calling on Fortune 500 companies. We compensate our AE's with a base salary, commissions and bonuses and have openings in Boston, New York, Atlanta, as well as in our corporate office in Irvine, CA.

#### Systems Engineers

For people on the go, this job's for you! As a Systems Engineer you will be installing our software products and providing professional support. You will have a minimum of 5 years experience with IBM AS/400 hardware and software including system performance and disaster recovery analysis, design, implementation and security management. You must have outstanding communications/presentation skills as well as past experience writing proposals, and technical reports. We'll compensate our Systems Engineers with a base salary, commissions and bonuses. You will be based out of our Irvine, CA office and travel extensively.

Our superior product and professional work environment set us apart from our competitors. For immediate consideration, send your resume indicating position of interest and salary requirements, to Vision Solutions, Inc., Attn: Human Resources - CW, 2800 Michelson Drive, 11th Floor, Irvine, California 92612. Facsimile: (714) 774-5470.

[www.visionsolutions.com](http://www.visionsolutions.com)

EOE/H/F/D/V



### DATABASE EXPERTS

Rating or desire more challenge? Our focus is D.B. Technology

We're looking for professionals with

• 5 years experience in DBA

• Relational & Fast Pen

• Oracle/Accenture

• Oracle DB to Sybase

• Load & physical design

• 10 yrs exp in DBA

• C/S Development to 360

• 6 yrs exp in DBA

• Informix DB to 370

• In line cost of living area

• Asia

• Oracle C++ to 8554

• Oracle C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

• IBM C++ to 8554

• IBM C++ to 8574

## BRING YOUR CAREER TO THE CUTTING EDGE OF IS/MEDICAL TECHNOLOGY.

The Information Services Division of St. Joseph's-St. Anthony's Health System takes special pride in its status as the highly advanced cybercenter supporting some of Tampa Bay's premier healthcare facilities. Our ongoing commitment to advanced technology and innovation has positioned us as a leader in the development of the next generation of medical technology. If you're an IS professional who thrives on the energy and excitement of a leading edge work environment, consider the following career opportunities.

### TEAM LEADER, CLINICAL SYSTEMS

Provides project leadership in support of the design, development, and implementation of new clinical systems. Possesses a sound working knowledge of the clinical environment along with excellent communications and presentation skills. An RN or previous clinical experience in Shared Medical Systems (SMS) INVISION systems preferred.

### INFORMATION TECHNOLOGY SPECIALIST

Assists in the development of project definition, planning, estimating, facilitating, analyzing, budgeting, management reporting and presenting of information technology and systems. A college degree in IS with 5 years of supervisory experience or relevant consulting experience preferred.

### BUSINESS SYSTEMS ANALYSTS

Two positions available for persons experienced in Shared Medical Systems (SMS) INVISION clinical applications. Skills required include proficiency in OAS building, Ad Hoc reporting, printing, and data warehousing. Experience in Shared Medical Systems (SMS) Patient Access, Physician Access, and Patient and Care Documentation. Additional preferred skills include use of QLIE scripting package and familiarity with Lifetime Clinical Record (LCR). One position requires valid Registered Nurse licensure and strong clinical and communication skills; the second position is for a "super-builder" where any clinical background is preferred by not required.

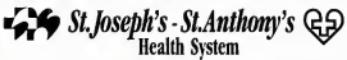
### PROGRAMMER ANALYST, SR.

Experienced Programmer Analyst. Sr. position requiring four years experience in design, coding, testing, documentation, implementation and maintenance of IBM Mainframe applications. Must have a minimum of two years experience with Shared Medical Systems (SMS) Patient Access, Physician Access, and Patient and Care Documentation. Candidate must be proficient in COBOL, MVS, and JCL. Other duties include support of EAD, OAS, Signature, Open Link, SUT implementations, interfaces and INVISION Segment Handler.

### OPERATIONS ANALYST

Experienced Operations Analyst to manage scheduling, automated report distribution, and change management in an MVS/ESA environment. Must be proficient in MVS, JCL and IBM Utilities. Must have experience with the following products: CAA, C-A7, CA-1 and CA-Dispatch. Experience in Shared Medical Systems (SMS) preferred.

In return for your expertise, we offer exceptional career development potential as well as a highly competitive salary/benefits package. We also offer an exciting and friendly company culture. We are located in Florida. Our Tampa Bay setting is an affordable housing, a top-rated school system, proximity to major attractions such as Disney World, and sparkling, sun-drenched beaches all year long. Please call 813-770-4857 or submit your resume in confidence to: Human Resources, St. Joseph's-St. Anthony's Health System, 3003 W. Dr. Martin Luther King, Jr. Blvd., Tampa, FL 33607. E-mail: [hrads@hrads.com](mailto:hrads@hrads.com). EOE. Drug-Free Workplace.



## FOUR SEASONS & A MILLION REASONS TO JOIN US



One of the largest tertiary care, teaching medical facilities in the Northeast, Dartmouth-Hitchcock Medical Center offers computer professionals high technology teamwork in a friendly, family oriented environment in one of New England's most beautiful & scenic mountain regions.

### COMPUTER SECURITY SPECIALIST

BS degree required, or well over 5 years'

experience in computer security administration.

### SR. PROGRAMMER/ANALYST

BS in related degree required, with 3-5 years' experience in system analysis or application development experience.

Background in M, COBOL, FOXUS, or C++ programming in strong area. Must have experience in UNIX, C, C++, and familiarity with Workstation and Internet based healthcare experience a plus.

Additional positions available in Burlington, MA & Bedford, NH

Dartmouth-Hitchcock Medical Center

Lahey Hitchcock Clinic/Mary Hitchcock Memorial Hospital

## We've Doubled the Opportunities

### PORTSMOUTH, NH

### BEVERLY/DANVERS, MA

The choice is yours. Work at our Corporate Data Center in the beautiful seacoast town of Portsmouth, NH, or our Massachusetts Development Center conveniently located just off Route 128 in the Beverly/Danvers area. Either way, Liberty Mutual US offers you the opportunity to design and develop cutting-edge business applications in an object-oriented, client/server environment. Increase your overall skills by working beside the most technologically advanced individuals in the country.

Liberty Mutual US dedicated to effectively applying leading-edge technology to the development of business solutions for our customers and our company. We offer you a remarkable opportunity, one that can provide you with the challenges, growth, experience and lifestyle you are seeking.

### Project Managers/Project Leaders

Coordinate the analysis, design, budget, technical resources and accuracy of I/T projects. Lead multiple projects involving data warehousing, in an ODBC client/server environment. Sybase/DB2 preferred. Experience with Win32 desktop, mid-range, and/or mainframe systems preferred.

### Client/Server & OO Developer

Design, develop, test and implement ODBC client/server systems. Experience with object oriented tools & methodologies (distributed objects and 3-tier architectures) Visual C++, VB, MPC, CORBA, MQ, C++, UNIX, Bouch/Rumbaugh, Jacobson, OMT, Rumbaugh, New, Ward/OMT, Win95/NT, R5000-ALX, HP-UX.

### Database & Technical/Programmer Analysts

Data modeling, application development and support in an ODBC client/server, mainframe environment. Experience in one or more of the following areas: Win 95/NT, 4D, UNIX/Sybase, Cobol, or MVS/IMS/DB2. Data modeling tool experience preferred.

### Software Test Leaders/Analysts

Assist in the development, implementation, and management of test plan analysis for a release. Define test cases/scripts, recommend test tools, execute test analysis/debug and optimize performance. Experience with Purify, Pure Coverage or QA Leader preferred.

### Business & Data Analysts/Architects

Structure and model shared data requirements and designs. Experience with data modeling, data flow and object modeling tools (Silversurfer or Rational Rose) preferred.

### Desktop/Networks/Telecom Support Services

Implement and support desktop migration, inter-networking technologies and telecom systems utilizing the newest tools and technologies on Win 95/NT, R5000-ALX, MVS mainframe systems. LAN/WAN, CS/DSU, R5000-ALX, PCX experience preferred.

If you're ready for the challenge of one of the most dynamic and changing industries in the world, come work for us. For better, faster, you can reach us at Bill Hickman, Liberty Mutual US, 225 Bartowick Avenue, Portsmouth, NH 03801. Fax: (603) 431-0799.

Liberty Mutual Group is an equal opportunity employer committed to workforce diversity.

Look us up on our web site at [www.libertymutual.com](http://www.libertymutual.com) or email us at: [Jobs@Lmig.com](mailto:Jobs@Lmig.com)

## SENIOR PROGRAMMER ANALYST

SMA is a not-for-profit managed care organization based in a suburb of New Orleans, Louisiana. SMA is the largest provider of managed care in the state of Mississippi, serving 1.2 million members in Mississippi and Arkansas covering over 44,000 providers. Additionally, in response to market and client demand, SMA has an HMO product which includes a network of over 2,000 Physicians and Specialists and 48 hospitals.

The Information Systems Department is looking for a highly motivated, service oriented individual to add to their staff of talented IS professionals to assist in the process of meeting the challenges of information delivery in a rapidly changing and competitive healthcare market.

Information Systems Department is seeking a highly motivated, experienced program manager interested in assisting in setting new standards for applications development and strategic planning. Responsibilities include identification of user needs and requirements to include debugging application programs, testing and programming. A minimum of 5 years experience in UNIX and PC programming using Oracle, FoxPro, or Access is preferred; MS Office Pro and UNIX experience a plus. Knowledge of a healthcare environment helpful.

We offer a competitive salary and relocation assistance. For immediate consideration, please forward your resume to:

Senior Computer Medical Alliance  
111 Webster Street, Suite 500  
Metairie, LA 70005

Attn: Director of Human Resources  
Fax Number: (504) 837-9063 or E-mail address  
PO Antonia@Sma.net

## SMA Southeast Medical Alliance

A Health Care Management Organization

An Equal Opportunity Employer

**LIBERTY  
MUTUAL**

The freedom of Liberty

## INFORMATION SYSTEMS PROFESSIONALS

Valley Health System, a regional health care provider located in the beautiful northern Shenandoah Valley, is seeking qualified candidates to join our Information Systems team. Great professional opportunities include:

### PROCESS ENGINEER

B.S. degree required, preferably in Industrial Engineering or Industrial Management. Once a professional experience with a hospital/health care firm desired; however, related experience in a non-medical field may be substituted in some cases.

### AS400 SYSTEMS ANALYST

Seeking applicants with a B.S. in Computer Science or a related field and at least 5 years experience with AS400 PC Network Installation and Support/Performance.

### INTERNET/INTRANET ANALYST

B.S. in Computer Science or related field required. Must also have diverse experience with corporate Internet solutions, enterprise intranet solutions, Oracle, and AS400/DB2 environments. Microsoft Exchange, and web server/network design. Programming experience and MS/PC preferred.

### COMPUTER INTEGRATED/INTERFACE SPECIALIST

Qualifications include a B.S. in Computer Science or related field with 2-3 years experience with UNIX and a working knowledge of C, C++, or C#. Should also have strong organizational and analytical skills and a general knowledge of interfaces. Experience with an interface engine and health care experience desired is not required.

### SR. PROGRAMMER & PROGRAMMER ANALYST

Should have B.S. in Computer Science or related field plus previous work experience with IBM AS400 and RDB III/DB2. Experience with 4GL, DB2, C/C++, and health care experience is a plus.

For consideration, please submit resume and cover letter specifying the position of interest to:

**HUMAN RESOURCES DEPT.**  
VALLEY HEALTH SYSTEM  
333 WEST CORK ST.  
WINSTON-SALEM, NC 27201  
FAX: (910) 775-5601  
EOE M/F/D/V



WILEY

Publishers Since 1807

We have an excellent opportunity for an experienced Unix Administrator and Senior Systems Developer to join John Wiley & Sons, Inc., a major publisher of a large and growing list of AS/400 and LAN-based computing environments. The company is recognized as the strongest in computer and Internet-related technologies and continues to make major investments in its international computer and network infrastructure. Founded in 1807, John Wiley & Sons, Inc. is an independent, global company with print and electronic products for the professional, educational, technical and consumer markets. Wiley has publishing, marketing and distribution centers in the U.S., Canada, Europe, Asia and Australia. The company is listed on the NYSE and can be reached on the Internet at [www.wiley.com](http://www.wiley.com).

### Senior Systems Developer

This position is located in Somersett, New Jersey in our U.S. Distribution Center. In this position you will have the opportunity to utilize the AS/400 to develop Web based applications for our Internet server platform including Java usage. Qualified candidates will have 2-3 years of RPG experience and completed at least one Syomon project. Knowledge of Internet technology and program management is highly desirable. No telephone, Order Processing, Accounts Receivable or sales experience a plus. You must possess strong verbal and written communication skills, as well as the ability to work well with users.

### Unix Administrator

This position is also located in Somersett, New Jersey in our U.S. Distribution Center. Qualified candidates will have 3-5 years of experience in Unix administration and technical support in a Sun/Windows environment including TCP/IP, security, hardware, network, system management, configuration, system performance, disk usage, backups and utilities, networking, firewalls, shell scripting and testing. Advanced PC knowledge including Windows, word processing, spreadsheet and communications software are also necessary. Strong verbal and written communication skills are a must.

Wiley offers a competitive salary and a comprehensive benefits package. Please send resumes, with salary requirements, to Human Resources Manager, John Wiley & Sons, Inc., 1 Wiley Drive, Somersett, New Jersey 08875 or fax to (908) 302-5386. Only those resumes with salary requirements will be considered.

## REDEFINING AS/400 Careers

### Best Places to Work '97

Client focus. Technological excellence. Consulting. Keen business insight. This is what sets Price Waterhouse apart from the competition and just one of the reasons why we are the team of choice for the world's top-tier business enterprises.

Record-breaking growth and exciting new projects have created exceptional AS/400 opportunities throughout our Northeast region.

To qualify you must possess the following:

- 3-5 years' AS/400 development/implementation experience
- Strong RPG/400 programming experience
- Knowledge of CL and SQL/400
- Some package implementation experience (J.D. Edwards, Software/2000, BPCS, Lawson)
- Distribution application knowledge a plus

Price Waterhouse offers a rewarding work environment, an outstanding compensation package, ongoing career development and flexible career options in a supportive and progressive environment. Advance this year in new opportunities and join us as we continue to grow. Price Waterhouse LLC, Management Consulting, Attn: PH-CW, 1177 Avenue of the Americas, New York, NY 10036, Fax: (212) 596-7959. We are proud to be an equal opportunity employer.

Visit our Web site: <http://www.pw.com>

### Price Waterhouse

Management Consulting

Price Waterhouse LLC



Start your day...

# COMPUTERWORLD

*The online connection for information technology leaders*



[www.computerworld.com](http://www.computerworld.com)

### SOFTWARE ENGINEER

Seeking Software Engineer for leading computer systems and equipment manufacturer. Project Engineer. Responsible for work in computer system architecture (minimum 1 semester), computer networks (minimum 1 semester), C++ programming (minimum 1 semester), TCP/IP or assembler computer programming language (minimum 1 semester), and object-oriented (graphical/Windows) computer programming language (minimum 1 semester), and computer graphics. (minimum 1 semester). All candidates must have the specific courses listed, approximately a minimum of 60 (60) months work experience as a software or applications engineer. Minimum 1 year experience in communications networks (minimum 6 months), C++ programming (minimum 6 months), TCP/IP (minimum 6 months), C/C++ or assembler computer programming language (minimum 6 months), object-oriented (graphical/Windows) computer programming language (minimum 6 months), and computer graphics (minimum 1 semester). Employee will be responsible for the design and development of products and software in accordance with compliance with network data communications standards such as TCP/IP, ATM, X.25, Novell protocol suite, and FDDI while utilizing C, C++, and assembly language programming languages, as well as 80386 assembly language. Employee should be capable for writing custom applications for specific hardware and equipment using object-oriented design and programming techniques. Experience with development tools: Employee will be required to use standard programming and user interface analysis techniques for development of a minimum of 100 hours per week for 40 hrs./wk. \$45,100/yr. All resumes must include: Name, Address, Phone, Email, Date, and Zip. Apply: Job Service, 1105 Brings Avenue, Duluth, GA 30032, or nearest Job Service office, or see Order Number NC3063032, DOT Code 030-082-012.

### AS/400 Programmer

AS/400 Programmer. \$44,000.00-\$50,000.00. Full application development life cycle activities for AS/400. Experience in RPG, RPG/400, CL, and SQL. Leads software design and development and provides fees to production software or data related technical support and then uses personnel in customer service and support. Develops critical applications to Billing, Sales Reporting, and Use of a new programming language. New Programmer/Analyst. Requires Minimum of 2 years experience in Science or Engineering, or equivalent, in Computer Science or Science or Engineering Plus Five Years of Experience as a Programmer/Analyst. Send resume and salary to: Henn Koff Business Applications, Inc., 1580 South Jackson, Jackson, MS 39201.

### SOFTWARE ENGINEER

To design, develop, test, maintain, and support various application software packages for personal computers. Manufacturing and Distribution industry clients using object-oriented design and development tools. Basic knowledge of UNIX environment. Perform analysis and design of programs. Requires M.S. in Computer Science and two years experience. Salary \$46,000 per year. 8 am to 5 pm, M-F. Send resume and salary to: Manager, Job Order, Netguru Systems, Inc., 240 Bloor Hill Rd., Suite 230, Weston, MA 02154.

### Sales Manager

Duties involve managing a sales force marketing software products to clients principally to banks, in Central and South America and the Caribbean. Hours are from 9:00 AM to 5:00 PM, Monday through Friday. Must begin having backer of business administration degree and must be willing to accept that 75% of all time outside of office is required. Must have five (5) years of work experience in sales. Salary \$2,000.00 per month. Please submit resume to Job Order, Job # 1000, Price Waterhouse, 9405 West Page Street, Miami, FL 33174-2900. Job Order No. FL-156358.





**JBA INTERNATIONAL**

JBA International, one of the "Top 50" software suppliers worldwide, provides software solutions to financial, customer service & logistics, manufacturing and service management markets. We offer a broad range of software solutions for most vertical markets, including apparel, automotive, beverage, food, tourism, and service management, as well as the System 21 Financials solution. JBA International also offers a software solution for small to midsize businesses. The JBA Channels Group is also an IBM Distributor for the AS/400, RS/6000 and iSeries product lines.

JBA has a strong relationship with IBM. JBA is an IBM Premier Business Partner and the only IBM Distributor designated as an IBM International Strategic Business Partner.

The JBA Channels Group sells exclusively through their network of Channel Partners. The JBA Channel Partner Program offers a variety of opportunities for Channel Partners to meet their specific goals. Solution Provider (formerly the IR Affiliate), Software Affiliate (SA) and Professional Services Affiliate (PSA). A Premier Channel Partner Program is also available.

Our dynamic company currently has the following positions available in our Chicago, Detroit, Dallas, Tampa, Atlanta, Boston, Toronto, Quebec, Mt. Laurel, NJ and Costa Mesa, CA offices:

- **PRES SALES TECHNICAL**      **TECHNICAL CONSULTANTS**  
Job Code: NA165CW      Job Code: NA163CW
- **TERITORY SALES REPRESENTATIVE**      **APPLICATION SUPPORT CONSULTANTS**  
Job Code: NA168CW      Job Code: NA166CW
- **CONSULTANTS**  
Job Code: NA162CW

Join our winning team as we continue to grow and expand in North America. We offer an excellent compensation and benefits package, including 401(k). For immediate consideration, please forward a resume with cover letter indicating salary requirements and appropriate job code.

JBA International  
North America Staffing  
161 Gaither Drive, Suite 200  
Mt. Laurel, NJ 08043  
FAX: 609-235-6464  
staffing@jba-careers.com



No phone calls please!

**New Perspectives**

As one of the world's largest, most technologically advanced financial institutions, Citicorp is unique in its ability to offer a wide range of sophisticated worldwide network linking over 90 countries and more than 100 formerly independent systems. Citicorp offers challenges that are unequalled anywhere.

Put your AS/400 skills to work in Denver!

If you're a technically talented programmer, consider this opportunity to contribute your skills to the fast-paced, multinational environment of our Global Business Development and Technology Department.

You must have 1-5 years' development experience in SYNQON, RPG/400, CL, SQL & Query.

In addition to excellent benefits and salary, we offer a non-smoking environment. Testing for the presence of illegal or controlled substances is mandatory. Job requirements: 5 years programming history, 100 Human Resources/GBIT, Job Code: GBOT971, Citicorp Diners Club, 183 Inverness Drive West, Englewood, CO 80112. Or fax (303) 649-2510. No phone calls, please. EOE M/F/D/V.

**CITICORP**  
An Equal Opportunity Employer M/F/D/V

# DISCOVER *The* INFORMATION SYSTEMS TEAM DISCOVER TUFTS

As the recognized  
leader in managed care,

Tufts understands the  
value of technology  
and training  
required to maintain

technical proficiency.  
The company also  
believes in empowering its

employees to deliver  
exceptional customer  
service and quality of care.

To be part of a winning  
IS team, look into  
these opportunities:

Tufts offers an excellent salary and benefits package. NO PHONE CALLS, PLEASE. Send resume and salary requirement to: Tufts Health Plan, HR Dept., Code SL, 333 Wyman St., Waltham, MA 02254; fax: 617-466-8590. E-mail: [human\\_resources@tufts-health.com](mailto:human_resources@tufts-health.com)

Dedicated to diversity. An equal opportunity employer.

**TUFTS**  **Health Plan**  
No one does more to keep you healthy

**United Arab Emirates** University has an immediate Opening for System Programmer/Administrator and Oracle Database Administrator. Interested persons should submit their resume along with three professional references to Computer Center, UAE University, P.O. Box 15551, Al Ain, U.A.E. within two weeks from the date of advertisement.

**Position Description:**

**Title:** Oracle System Programmer/Administrator

**Education:** Master/Bachelor of Science in Computer Science or equivalent

**Experience:**

1. Minimum Five Years experience in computing with at least Three Years in one of UNIX operating system environment Sun Solaris, Digital UNIX and IBM AIX.
2. Experience in System and Management Administration of UNIX, System Security, Performance and Network Management including Intranet, Internet, Networking between different operating platforms.
3. World Wide Web, Domain Name Servers, SMTP Mail Servers, POP Mail Servers, SENDMAIL, C language, Java HTML, a definite PLUS.

**Position Description:**

**Title:** Oracle Database Administrator

**Education:** University degree in a computer science, business, or related field

**Experience:**

1. Excellent of all concept relating to system analysis and database design is a MUST
2. Excellent of all concept relating to Client/Server application design architecture is a MUST
3. Excellent working knowledge with ORACLE DBMS 7.x, and SQL is a MUST
4. Working with Oracle on various UNIX operating systems is a MUST
5. Knowledge of Oracle 7.3, 7.5, 7.7, 8.0, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 8.10, 8.11, 8.12, 8.13, 8.14, 8.15, 8.16, 8.17, 8.18, 8.19, 8.20, 8.21, 8.22, 8.23, 8.24, 8.25, 8.26, 8.27, 8.28, 8.29, 8.30, 8.31, 8.32, 8.33, 8.34, 8.35, 8.36, 8.37, 8.38, 8.39, 8.40, 8.41, 8.42, 8.43, 8.44, 8.45, 8.46, 8.47, 8.48, 8.49, 8.50, 8.51, 8.52, 8.53, 8.54, 8.55, 8.56, 8.57, 8.58, 8.59, 8.60, 8.61, 8.62, 8.63, 8.64, 8.65, 8.66, 8.67, 8.68, 8.69, 8.70, 8.71, 8.72, 8.73, 8.74, 8.75, 8.76, 8.77, 8.78, 8.79, 8.80, 8.81, 8.82, 8.83, 8.84, 8.85, 8.86, 8.87, 8.88, 8.89, 8.90, 8.91, 8.92, 8.93, 8.94, 8.95, 8.96, 8.97, 8.98, 8.99, 8.100, 8.101, 8.102, 8.103, 8.104, 8.105, 8.106, 8.107, 8.108, 8.109, 8.110, 8.111, 8.112, 8.113, 8.114, 8.115, 8.116, 8.117, 8.118, 8.119, 8.120, 8.121, 8.122, 8.123, 8.124, 8.125, 8.126, 8.127, 8.128, 8.129, 8.130, 8.131, 8.132, 8.133, 8.134, 8.135, 8.136, 8.137, 8.138, 8.139, 8.140, 8.141, 8.142, 8.143, 8.144, 8.145, 8.146, 8.147, 8.148, 8.149, 8.150, 8.151, 8.152, 8.153, 8.154, 8.155, 8.156, 8.157, 8.158, 8.159, 8.160, 8.161, 8.162, 8.163, 8.164, 8.165, 8.166, 8.167, 8.168, 8.169, 8.170, 8.171, 8.172, 8.173, 8.174, 8.175, 8.176, 8.177, 8.178, 8.179, 8.180, 8.181, 8.182, 8.183, 8.184, 8.185, 8.186, 8.187, 8.188, 8.189, 8.190, 8.191, 8.192, 8.193, 8.194, 8.195, 8.196, 8.197, 8.198, 8.199, 8.200, 8.201, 8.202, 8.203, 8.204, 8.205, 8.206, 8.207, 8.208, 8.209, 8.210, 8.211, 8.212, 8.213, 8.214, 8.215, 8.216, 8.217, 8.218, 8.219, 8.220, 8.221, 8.222, 8.223, 8.224, 8.225, 8.226, 8.227, 8.228, 8.229, 8.230, 8.231, 8.232, 8.233, 8.234, 8.235, 8.236, 8.237, 8.238, 8.239, 8.240, 8.241, 8.242, 8.243, 8.244, 8.245, 8.246, 8.247, 8.248, 8.249, 8.250, 8.251, 8.252, 8.253, 8.254, 8.255, 8.256, 8.257, 8.258, 8.259, 8.260, 8.261, 8.262, 8.263, 8.264, 8.265, 8.266, 8.267, 8.268, 8.269, 8.270, 8.271, 8.272, 8.273, 8.274, 8.275, 8.276, 8.277, 8.278, 8.279, 8.280, 8.281, 8.282, 8.283, 8.284, 8.285, 8.286, 8.287, 8.288, 8.289, 8.290, 8.291, 8.292, 8.293, 8.294, 8.295, 8.296, 8.297, 8.298, 8.299, 8.300, 8.301, 8.302, 8.303, 8.304, 8.305, 8.306, 8.307, 8.308, 8.309, 8.310, 8.311, 8.312, 8.313, 8.314, 8.315, 8.316, 8.317, 8.318, 8.319, 8.320, 8.321, 8.322, 8.323, 8.324, 8.325, 8.326, 8.327, 8.328, 8.329, 8.330, 8.331, 8.332, 8.333, 8.334, 8.335, 8.336, 8.337, 8.338, 8.339, 8.340, 8.341, 8.342, 8.343, 8.344, 8.345, 8.346, 8.347, 8.348, 8.349, 8.350, 8.351, 8.352, 8.353, 8.354, 8.355, 8.356, 8.357, 8.358, 8.359, 8.360, 8.361, 8.362, 8.363, 8.364, 8.365, 8.366, 8.367, 8.368, 8.369, 8.370, 8.371, 8.372, 8.373, 8.374, 8.375, 8.376, 8.377, 8.378, 8.379, 8.380, 8.381, 8.382, 8.383, 8.384, 8.385, 8.386, 8.387, 8.388, 8.389, 8.390, 8.391, 8.392, 8.393, 8.394, 8.395, 8.396, 8.397, 8.398, 8.399, 8.400, 8.401, 8.402, 8.403, 8.404, 8.405, 8.406, 8.407, 8.408, 8.409, 8.410, 8.411, 8.412, 8.413, 8.414, 8.415, 8.416, 8.417, 8.418, 8.419, 8.420, 8.421, 8.422, 8.423, 8.424, 8.425, 8.426, 8.427, 8.428, 8.429, 8.430, 8.431, 8.432, 8.433, 8.434, 8.435, 8.436, 8.437, 8.438, 8.439, 8.440, 8.441, 8.442, 8.443, 8.444, 8.445, 8.446, 8.447, 8.448, 8.449, 8.450, 8.451, 8.452, 8.453, 8.454, 8.455, 8.456, 8.457, 8.458, 8.459, 8.460, 8.461, 8.462, 8.463, 8.464, 8.465, 8.466, 8.467, 8.468, 8.469, 8.470, 8.471, 8.472, 8.473, 8.474, 8.475, 8.476, 8.477, 8.478, 8.479, 8.480, 8.481, 8.482, 8.483, 8.484, 8.485, 8.486, 8.487, 8.488, 8.489, 8.490, 8.491, 8.492, 8.493, 8.494, 8.495, 8.496, 8.497, 8.498, 8.499, 8.500, 8.501, 8.502, 8.503, 8.504, 8.505, 8.506, 8.507, 8.508, 8.509, 8.510, 8.511, 8.512, 8.513, 8.514, 8.515, 8.516, 8.517, 8.518, 8.519, 8.520, 8.521, 8.522, 8.523, 8.524, 8.525, 8.526, 8.527, 8.528, 8.529, 8.530, 8.531, 8.532, 8.533, 8.534, 8.535, 8.536, 8.537, 8.538, 8.539, 8.540, 8.541, 8.542, 8.543, 8.544, 8.545, 8.546, 8.547, 8.548, 8.549, 8.550, 8.551, 8.552, 8.553, 8.554, 8.555, 8.556, 8.557, 8.558, 8.559, 8.560, 8.561, 8.562, 8.563, 8.564, 8.565, 8.566, 8.567, 8.568, 8.569, 8.570, 8.571, 8.572, 8.573, 8.574, 8.575, 8.576, 8.577, 8.578, 8.579, 8.580, 8.581, 8.582, 8.583, 8.584, 8.585, 8.586, 8.587, 8.588, 8.589, 8.590, 8.591, 8.592, 8.593, 8.594, 8.595, 8.596, 8.597, 8.598, 8.599, 8.510, 8.511, 8.512, 8.513, 8.514, 8.515, 8.516, 8.517, 8.518, 8.519, 8.520, 8.521, 8.522, 8.523, 8.524, 8.525, 8.526, 8.527, 8.528, 8.529, 8.530, 8.531, 8.532, 8.533, 8.534, 8.535, 8.536, 8.537, 8.538, 8.539, 8.540, 8.541, 8.542, 8.543, 8.544, 8.545, 8.546, 8.547, 8.548, 8.549, 8.550, 8.551, 8.552, 8.553, 8.554, 8.555, 8.556, 8.557, 8.558, 8.559, 8.5510, 8.5511, 8.5512, 8.5513, 8.5514, 8.5515, 8.5516, 8.5517, 8.5518, 8.5519, 8.5520, 8.5521, 8.5522, 8.5523, 8.5524, 8.5525, 8.5526, 8.5527, 8.5528, 8.5529, 8.5530, 8.5531, 8.5532, 8.5533, 8.5534, 8.5535, 8.5536, 8.5537, 8.5538, 8.5539, 8.5540, 8.5541, 8.5542, 8.5543, 8.5544, 8.5545, 8.5546, 8.5547, 8.5548, 8.5549, 8.55410, 8.55411, 8.55412, 8.55413, 8.55414, 8.55415, 8.55416, 8.55417, 8.55418, 8.55419, 8.55420, 8.55421, 8.55422, 8.55423, 8.55424, 8.55425, 8.55426, 8.55427, 8.55428, 8.55429, 8.55430, 8.55431, 8.55432, 8.55433, 8.55434, 8.55435, 8.55436, 8.55437, 8.55438, 8.55439, 8.55440, 8.55441, 8.55442, 8.55443, 8.55444, 8.55445, 8.55446, 8.55447, 8.55448, 8.55449, 8.55450, 8.55451, 8.55452, 8.55453, 8.55454, 8.55455, 8.55456, 8.55457, 8.55458, 8.55459, 8.554510, 8.554511, 8.554512, 8.554513, 8.554514, 8.554515, 8.554516, 8.554517, 8.554518, 8.554519, 8.554520, 8.554521, 8.554522, 8.554523, 8.554524, 8.554525, 8.554526, 8.554527, 8.554528, 8.554529, 8.554530, 8.554531, 8.554532, 8.554533, 8.554534, 8.554535, 8.554536, 8.554537, 8.554538, 8.554539, 8.554540, 8.554541, 8.554542, 8.554543, 8.554544, 8.554545, 8.554546, 8.554547, 8.554548, 8.554549, 8.5545410, 8.5545411, 8.5545412, 8.5545413, 8.5545414, 8.5545415, 8.5545416, 8.5545417, 8.5545418, 8.5545419, 8.5545420, 8.5545421, 8.5545422, 8.5545423, 8.5545424, 8.5545425, 8.5545426, 8.5545427, 8.5545428, 8.5545429, 8.5545430, 8.5545431, 8.5545432, 8.5545433, 8.5545434, 8.5545435, 8.5545436, 8.5545437, 8.5545438, 8.5545439, 8.5545440, 8.5545441, 8.5545442, 8.5545443, 8.5545444, 8.5545445, 8.5545446, 8.5545447, 8.5545448, 8.5545449, 8.5545450, 8.5545451, 8.5545452, 8.5545453, 8.5545454, 8.5545455, 8.5545456, 8.5545457, 8.5545458, 8.5545459, 8.55454510, 8.55454511, 8.55454512, 8.55454513, 8.55454514, 8.55454515, 8.55454516, 8.55454517, 8.55454518, 8.55454519, 8.55454520, 8.55454521, 8.55454522, 8.55454523, 8.55454524, 8.55454525, 8.55454526, 8.55454527, 8.55454528, 8.55454529, 8.55454530, 8.55454531, 8.55454532, 8.55454533, 8.55454534, 8.55454535, 8.55454536, 8.55454537, 8.55454538, 8.55454539, 8.55454540, 8.55454541, 8.55454542, 8.55454543, 8.55454544, 8.55454545, 8.55454546, 8.55454547, 8.55454548, 8.55454549, 8.554545410, 8.554545411, 8.554545412, 8.554545413, 8.554545414, 8.554545415, 8.554545416, 8.554545417, 8.554545418, 8.554545419, 8.554545420, 8.554545421, 8.554545422, 8.554545423, 8.554545424, 8.554545425, 8.554545426, 8.554545427, 8.554545428, 8.554545429, 8.554545430, 8.554545431, 8.554545432, 8.554545433, 8.554545434, 8.554545435, 8.554545436, 8.554545437, 8.554545438, 8.554545439, 8.554545440, 8.554545441, 8.554545442, 8.554545443, 8.554545444, 8.554545445, 8.554545446, 8.554545447, 8.554545448, 8.554545449, 8.554545450, 8.554545451, 8.554545452, 8.554545453, 8.554545454, 8.554545455, 8.554545456, 8.554545457, 8.554545458, 8.554545459, 8.5545454510, 8.5545454511, 8.5545454512, 8.5545454513, 8.5545454514, 8.5545454515, 8.5545454516, 8.5545454517, 8.5545454518, 8.5545454519, 8.5545454520, 8.5545454521, 8.5545454522, 8.5545454523, 8.5545454524, 8.5545454525, 8.5545454526, 8.5545454527, 8.5545454528, 8.5545454529, 8.5545454530, 8.5545454531, 8.5545454532, 8.5545454533, 8.5545454534, 8.5545454535, 8.5545454536, 8.5545454537, 8.5545454538, 8.5545454539, 8.5545454540, 8.5545454541, 8.5545454542, 8.5545454543, 8.5545454544, 8.5545454545, 8.5545454546, 8.5545454547, 8.5545454548, 8.5545454549, 8.55454545410, 8.55454545411, 8.55454545412, 8.55454545413, 8.55454545414, 8.55454545415, 8.55454545416, 8.55454545417, 8.55454545418, 8.55454545419, 8.55454545420, 8.55454545421, 8.55454545422, 8.55454545423, 8.55454545424, 8.55454545425, 8.55454545426, 8.55454545427, 8.55454545428, 8.55454545429, 8.55454545430, 8.55454545431, 8.55454545432, 8.55454545433, 8.55454545434, 8.55454545435, 8.55454545436, 8.55454545437, 8.55454545438, 8.55454545439, 8.55454545440, 8.55454545441, 8.55454545442, 8.55454545443, 8.55454545444, 8.55454545445, 8.55454545446, 8.55454545447, 8.55454545448, 8.55454545449, 8.55454545450, 8.55454545451, 8.55454545452, 8.55454545453, 8.55454545454, 8.55454545455, 8.55454545456, 8.55454545457, 8.55454545458, 8.55454545459, 8.55454545460, 8.55454545461, 8.55454545462, 8.55454545463, 8.55454545464, 8.55454545465, 8.55454545466, 8.55454545467, 8.55454545468, 8.55454545469, 8.55454545470, 8.55454545471, 8.55454545472, 8.55454545473, 8.55454545474, 8.55454545475, 8.55454545476, 8.55454545477, 8.55454545478, 8.55454545479, 8.55454545480, 8.55454545481, 8.55454545482, 8.55454545483, 8.55454545484, 8.55454545485, 8.55454545486, 8.55454545487, 8.55454545488, 8.55454545489, 8.55454545490, 8.55454545491, 8.55454545492, 8.55454545493, 8.55454545494, 8.55454545495, 8.55454545496, 8.55454545497, 8.55454545498, 8.55454545499, 8.554545454100, 8.554545454111, 8.554545454122, 8.554545454133, 8.554545454144, 8.554545454155, 8.554545454166, 8.554545454177, 8.554545454188, 8.554545454199, 8.554545454210, 8.554545454221, 8.554545454232, 8.554545454243, 8.554545454254, 8.554545454265, 8.554545454276, 8.554545454287, 8.554545454298, 8.554545454309, 8.554545454310, 8.554545454321, 8.554545454332, 8.554545454343, 8.554545454354, 8.554545454365, 8.554545454376, 8.554545454387, 8.554545454398, 8.554545454409, 8.554545454410, 8.554545454421, 8.554545454432, 8.554545454443, 8.554545454454, 8.554545454465, 8.554545454476, 8.554545454487, 8.554545454498, 8.554545454509, 8.554545454510, 8.554545454521, 8.554545454532, 8.554545454543, 8.554545454554, 8.554545454565, 8.554545454576, 8.554545454587, 8.554545454598, 8.554545454609, 8.554545454610, 8.554545454621, 8.554545454632, 8.554545454643, 8.554545454654, 8.554545454665, 8.554545454676, 8.554545454687, 8.554545454698, 8.554545454709, 8.554545454710, 8.554545454721, 8.554545454732, 8.554545454743, 8.554545454754, 8.554545454765, 8.554545454776, 8.554545454787, 8.554545454798, 8.554545454809, 8.554545454810, 8.554545454821, 8.554545454832, 8.554545454843, 8.554545454854, 8.554545454865, 8.554545454876, 8.554545454887, 8.554545454898, 8.554545454909, 8.554545454910, 8.554545454921, 8.554545454932, 8.554545454943, 8.554545454954, 8.554545454965, 8.554545454976, 8.554545454987, 8.554545454998, 8.554545454101, 8.554545454112, 8.554545454123, 8.554545454134, 8.554545454145, 8.554545454156, 8.554545454167, 8.554545454178, 8.554545454189, 8.554545454190, 8.554545454201, 8.554545454212, 8.554545454223, 8.554545454234, 8.554545454245, 8.554545454256, 8.554545454267, 8.554545454278, 8.554545454289, 8.554545454290, 8.554545454301, 8.554545454312, 8.554545454323, 8.554545454334, 8.554545454345, 8.554545454356, 8.554545454367, 8.554545454378, 8.554545454389, 8.554545454390, 8.554545454401, 8.554545454412, 8.554545454423, 8.554545454434, 8.554545454445, 8.554545454456, 8.554545454467, 8.554545454478, 8.554545454489, 8.554545454490, 8.554545454501, 8.554545454512, 8.554545454523, 8.554545454534, 8.554545454545, 8.554545454556, 8.554545454567, 8.554545454578, 8.554545454589, 8.554545454590, 8.554545454601, 8.554545454612, 8.554545454623, 8.554545454634, 8.554545454645, 8.554545454656, 8.554545454667, 8.554545454678, 8.554545454689, 8.554545454690, 8.554545454701, 8.55



## Our Sophisticated Systems Support The Most Basic Ones

Behind the scenes at NCH Healthcare System are some very complex systems: those that ensure medication is dispensed efficiently, records are kept accurately and vital signs are monitored unerringly. Supporting the people who make these systems work on our front line are the talented and dedicated IT professionals who make it happen. Put your ambition and skills to good use at NCH as a:

### Programming Manager

Requires strong managerial experience, including coordinating complex projects and meeting deadlines, coupled with at least five years of AS/400 RPG programming. Proven team-building and customer service skills also required. Experience in other programming languages helpful. Bachelor's degree required.

### Technical Services Manager

The ideal candidate will have in-depth experience with networks, client/server environment, Windows NT and Windows 95. Proven customer service and managerial experience, including staff development and performance reviews are required. Bachelor's degree preferred.

### Senior Applications Analyst

You must have at least 5 years AS/400 RPG experience. Health care software applications experience, especially SMS/Med Series 4 or HOCIC (BAXA) Pharmacy, preferred. Interface or EDI programming experience helpful.

### Network Technicians

Novell, Windows 95/NT, and other PC/network experience along with ability to configure PCs with a host of network protocols/software and Novell file servers required. Candidates must also have excellent communication and technical skills and expertise with Microsoft Office, WordPerfect, Lotus or other desktop applications.

### Systems Analysts

5 years systems analysis experience with at least 2 years in health care, and a proven ability to manage software selection and implementation projects required. Bachelor's degree required; MBA preferred. Good oral and communication skills necessary. One position requires experience with document imaging technology.

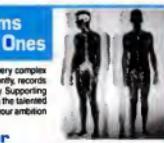
### Systems Programmer

Candidates should have 5 years experience in a DEC VAX environment, preferably with Cerner Software. Must be proficient at loading and maintaining operating system software, system performance analysis, system configuration, disk space management, and resource planning. Additional experience with IBM AS/400 is a plus.

Support our systems with your own. We offer competitive wages and comprehensive benefits, including relocation assistance. For immediate consideration, forward your resume to:

Naples Community Hospital  
Attn: Human Resources, Dept. SD  
P.O. Box 413029  
Naples, FL 34161-3029  
Fax: (941) 436-5049

An Equal Opportunity Employer/Drug-Free Workplace



Software Engineer I to develop and transfer Surface Mount Technology (SMT) assembly software for use in firm factories including those in Taiwan and Hong Kong, China, and Singapore. Experience in assembly line, pick and place, feeder optimization, set-up optimization, part placement programs, board test, and wave solder placement machine models for development of new optimization algorithms. Experience in use of optimization tools for assembly line placement of SMT machines. Travel to factories in Asia to provide troubleshooting and assembly line optimization training running in the factory. Utilize C/C++ language, capacity to communicate in English and Chinese. Experience in firm factories at Asian manufacturing facilities to develop and maintain assembly line software to debug software where problems are detected. Experience in assembly line and functions. Analysis, data requirements for optimization, assembly line placement proposals for projects with factories including time and cost analysis, assembly line optimization, and scheduling to schedule. Train line on use of software to develop assembly line software process standards. Will utilize UNIX, C/C++, Visual Basic, and SMAT optimization software developed by firm. Must have a Master's degree in Computer Science or Electrical Engineering, and a minimum of 3 years experience as well as one year of experience as a Software Engineer. Experience as a Software Engineer, vendor, Research Analyst, and/or Project Manager. Research and academic research must have included optimization of SMT manufacturing processes, assembly line optimization algorithms and development of assembly line placement, assembly line optimization, and placement machine models for SMT machines. Experience must have included assembly line placement and implementing optimizers to reduce parts placement time. Applications must include those involved in use of Visual Basic, C and C++, Oracle, and Microsoft Access. Write and read Chinese. Applicants must have completed one year of experience in electronic packaging systems and manufacturing processes, assembly line, networks, systems for factory information and control, research and development, and academic research. Must have proof of living in the U.S. Send 2 copies of both resume and cover letter to: Human Resources, Department Security, 401 S. State-3 South, Chicago, IL 60603. Attention: Human Resources, Dept. SD. No Calls. Employer Paid ad.

PROGRAMMER ANALYST I (2 Openings): Plan, develop, test & document computer programs, applications, and data for use in programming techniques & computer systems; evaluate user requests for new programs and modifications to determine feasibility, cost & time requirements; consult with current system & computer capabilities; consult with users to identify system requirements; analyze & clarify program objectives; formulate plan outlining steps required to implement system; perform required analysis & design; convert project specifications, using flowcharts, logic diagrams, and detailed instructions & logical steps for coding into language processor; require knowledge of computer programming techniques & computer system architecture; perform development & maintenance of system; system testing & user training. Job requires following: CICS, COBOL, II, IBM DB & MVS, RPG, PL/I, AS/400, COBOL, System Science, Systems Analysis, Computer Information Systems, Electrical Engineering, Mathematics or its equivalent in education & exp. 2-5 yrs. in job. Experience in a related occupation such as Programmer, Programmer Analyst, Computer Systems Engineer, Assistant Systems Engineer, Manager or Consultant. Will accept 3 yrs. college education plus 3 yrs. exp. in job. Experience in a related occupation in lieu of the required education & experience. Must have knowledge of system design, designing & developing systems and network systems. Experience in AS/400, COBOL, IBM DB and MVS; \$44,000/yr., 40 hrs/wk, B/E/S. Send resumes to: Human Resources, Dept. SD, 401 S. State-3 South, Detroit, MI 48202 & include Ref# 157196. Employer Paid Ad

# Let COMPUTERWORLD help with your I.T. salaries

The industry's most authoritative resource for setting I.T. salaries is now available on disk.

Computerworld's 10th annual Salary Survey on disk reveals the salaries of 27 I.T. positions, by 21 industries and 9 regional breakouts.



## Attracting the best minds in Information Architecture

Through our expertise and success since 1979, Spectrum has become nationally recognized and respected for providing Information Architecture and project-oriented Application Solutions to our Fortune 100 clients.

For seventeen years, Spectrum has built its business on the simple premise that a consulting firm is only as strong as its staff. At Spectrum, each employee plays a vital role in our success through hard work, versatility, and commitment. In return, Spectrum makes a considerable investment in you. We offer competitive compensation, excellent benefits, competitive salaries, technical project management and methodology training and certification, and an experienced management team committed to your career growth.

### IT Management Consultants

### Enterprise/Data Modelers

### Data Warehouse Analysts & Designers

All Spectrum employees are full-time and receive comprehensive benefits including a matching 401k plan. Opportunities exist with our New Jersey, England, and National practice centers. Interested in relocating to New Jersey or Boston area, we offer an attractive relocation package. To work with the best IT minds in the business, please call (908) 725-6000, ext. 334. Or forward your resume to: Spectrum Technology Group, Inc., 3421 US Highway 22, Piscataway, NJ 08876-6026. Fax (908) 725-6000. E-mail: [recruiting@spectrum.com](mailto:recruiting@spectrum.com)

**SPECTRUM**  
Technology Group, Inc.

Equal Opportunity Employer M/F/H/V. EOE

Also included is Computerworld's

### Skill Survey

- Learn the premiums I.T. managers are paying for specific I.T. skills.
- How are full-time and contract workers being paid for the same skill?
- Which skills are in the highest demand?
- Over 80 skills are listed including languages, development tools, client/server applications, system software, groupware, networking and more. Each broken out by 20 industries and 9 geographic regions.

price: \$349

to order, call  
**1-800-500-7460**

**TAX FREE IN SAUDI ARABIA**

**Arabian Computer Projects Ltd.** one of the leading IT organizations in Saudi Arabia and a member of the prestigious Jelfali Group of Companies require following professional staff:

- Technical Support Consultants
- Application Consultants
- Project Leaders and Systems Analysts
- Sales Managers/Sales Representatives
- Communications specialists
- Systems Programmers

The specialization can be in one or more of the following:

- SYBASE or other RDBMS
- PowerBuilder
- Lotus Notes
- Dun & Bradstreet Software, BPCS or similar software
- AS/400, RS/6000
- CISCO or 3COM

ACP offers an attractive Tax free compensation which includes Free Housing (or housing allowance), free medical, ticket paid vacation, transportation allowance etc.

Please send your CV to following address:

**Arabian Computer Projects Ltd.**  
P.O. Box 818, Riyadh - 11421, K.S.A.  
Fax: +966 1 403 9191, Tel: +966 1 403 6805

spearhead™

# SAP

## PROFESSIONALS

Fast-growing national and international consultancy

with a reputation for first-class consultant offers

### WORLD-WIDE CAREER OPPORTUNITIES FOR TOP QUALITY PROFESSIONALS

#### CURRENTLY STAFFING PROJECTS IN:

US, Canada, South America Pacific Rim and Europe:  
especially in these skills and industries: F100, Basis, ABAP/4, PM, MM,  
WM, PP, SD, EDI in SAP Environment, Supply Chain/Manufacturing  
utilities and Retail Experience in a SAP Environment.

LI/NYC: Marketing/Sales/Technical/Recruiter and Technology Infrastructure

Competitive compensation with performance incentives  
for strong professionals with deep experience;  
comprehensive benefits package

▲ EXPERIENCED PROJECT MANAGERS	\$ 180 K+
▲ TEAM LEADERS	\$ 150 K+
▲ CONSULTANTS	\$ 100 K+

Send Resumes to the Attention of Resource Manager.

**Purdue University****Faculty Positions****Computer Information Systems & Technology**

Purdue University, Department of Computer Technology invites applications for tenure-track assistant professor positions at its West Lafayette and Statewide technology campuses beginning in 1997 or January 1998. The faculty member will be involved in teaching and educational scholarship (not basic or applied research). The West Lafayette campus is seeking (1) a faculty member with a strong background in database design and data management, (2) a faculty member who can develop and teach an end user computing minor, and (3) a faculty member with a strong background in systems programming and application development. Statewide Technology campuses seek candidates who can deliver most of an associate degree curriculum that focuses on the application of computers in the context of information systems and development. Candidates must have an earned Master's degree in a relevant field (Computer Engineering, Computer Science, Computer Information Systems, Computer Technology, Computer Applications, etc.) and industrial experience in information systems development. Prior teaching experience is preferred. Applications will be accepted until the positions are filled. Send a detailed resume and three letters of reference and academic transcripts to: Professor L. C. Codd, Department of Computer Technology, Purdue University, 1421 Krupp Hall 242, West Lafayette, IN 47907-1421. Questions may be directed to (765) 494-6000 or by e-mail to [lcodd@tech.purdue.edu](mailto:lcodd@tech.purdue.edu). Visit us on the WWW at <http://tech.purdue.edu>. Purdue University is an equal opportunity, affirmative action employer.

SEE US AT ASUG  
Booth 127-129



# SPEARHEAD

## System Consultants (US) Ltd.

99 Seaview Blvd., Suite 340, Port Washington, NY 11050 • voice 516-625-8000, fax 516-625-9667  
55 Broad St., Suite 13F, New York, NY 10004 • 212-968-1346, 212-968-1348, fax 212-968-1352  
e-mail [spear@interramp.com](mailto:spear@interramp.com) • world wide web <http://www.spearhead.com>  
1,888 spearhead  
SAP™ National Implementation Partner

**SOFTWARE ENGINEER**  
Responsible for developing computer software systems for manufacture and distribution of electrical parts, applying principles of engineering and computer science, engineering, and mathematical analysis. Analyze software requirements to determine configurations of hardware and/or software systems. Develops & directs software system testing procedures, programming, & documentation. Coordinates enhancement, customization, maintenance, & system administration. Develops software systems using HP 9000 series computer running HP-UX 10.0, UNISYS 8000 running UNIX System V 4.0, & Informix 10.0, and Informix 5.0. Oracle, Sybase, and Master's 5.0 deg. in Electrical Engineering or Computer Science, & 1 yr. exp. in software development. Exp. Exp. in the use of the following hardware: HP 9000/800 computer running HP-UX 10.0, UNISYS 8000 running UNIX System V 4.0, and Informix 5.0. Oracle, Sybase, and Master's 5.0 deg. in Electrical Engineering or Computer Science, & 1 yr. exp. in software development.

## We are Banking...on your success.

**Atlantic Data Services, Inc.** is a recognized leader in providing innovative customer-focused solutions to the Banking/Financial industry. Explosive growth in the demand for our project management capabilities and our industry expertise, has created exceptional career opportunities on a nationwide basis. We're inviting you to share in the opportunities that will spearhead the future of the industry.

### Technical/Banking Consultants

We seek Consultants at all levels to assist us in implementing projects for major banks and financial institutions. Selected candidates will have technical and/or analytical skills in one or more of the following areas:

- Deposits
- Home Banking
- Billing Systems
- Loans
- Credit Card
- Year 2000
- VAX, UNIX, Client Server, Tandem
- COBOL, CICS, VSAM, JCL, PL/I
- POWERBUILD, C, C++, SQL
- GUPTA, Visual C++, Java, GUI, HTML

**Project Managers**

These key positions are for candidates who have proven success in:

- Applications Development
- Maintenance and Outsourcing
- Full life-cycle project management capabilities
- Effective client management skills
- Banking or financial experience is a plus.

Send resume to:

**IHN, Atlantic Data Services,  
One Batterymarch Park,  
Quincy, MA 02169,  
FAX: (617) 689-1103  
[inaar@ultranet.com](mailto:inaar@ultranet.com)**



### Computer Jobs... Lots of 'em.

<http://www.select.com>

If you must...  
**954-424-0563**

**Brady &  
Company  
INC.**

### CONSULTANTS NEEDED NATIONWIDE.

If you have MRP, QAD appl.

ORACLE, C/C++ exp.

We have the Answers

1-800-892-3956

<http://www.Bradycorp.com>

[www.experienceondemand.com](http://www.experienceondemand.com)

# Career Upgrade

*Get your career back up to speed.*

Our FREE Salary Survey and Career Planning Guide can help get you back on line. Knowing where you stand is critical whether searching for a job or preparing for a review. You'll find

up-to-date statistics on salaries in your area and essential advice on assessing your career. Get your

FREE copy today.

*It's time you know.*

Get your FREE Salary Survey by visiting our web site.  
[www.experienceondemand.com](http://www.experienceondemand.com)

 **Source Edp**  
Your Learning Connection  
A Division of Source Services Corporation

 **Source Consulting**  
Your Learning Connection  
A Division of Source Services Corporation

**Experience on Demand™**

To discuss your career options directly with a Source professional call  
1-800-840-8090 ext. 300



**Reserve your place at the hottest conference of the year.**



**June 8 - 11, 1997**  
**Marriott Rivercenter Hotel**  
**San Antonio, Texas**

\*\*\*\*\*

**Call  
1-800-488-9204  
for info**

# LONGABERGER

## PUT YOUR CAREER IN DRIVE!

If you're ready to submerge yourself in an exciting fast-paced environment, then make the move to Longaberger! We are currently seeking talented IS professionals to share their input and make a difference in our expanding enterprise. If you'd like to be part of our Company's phenomenal success, consider the following opportunities:

### SOFTWARE DEVELOPERS

All levels of Developers including Programmers/Analysts through Project Leaders are needed. Must possess 1 or more of the following skills: PowerBuilder, RPG, C/C++, UNIX, DB2, Software 2000, Visual Basic, Oracle, client/server, AS/400, and UNIX platforms.

### QUALITY ASSURANCE ENGINEER

Must be an experienced IS Project Manager that will ensure projects proceed and conclude according to established standards. 6+ years' client/server applications development experience as well as experience with full life cycle of large development projects required.

### JBA SYSTEM 21 PROJECT LEADER

An opportunity exists for an experienced JBA System 21 Implementer for the manufacturing division. Experience should include managing projects on AS/400 platform and full life cycle development as well as use of case tools and formal system design methodologies.

### DIRECTOR, SYSTEMS AND PROGRAMMING

This internal Director position requires formal project management experience of large systems development. Qualified candidate must be a visionary with a strong focus on quality assurance, user training, vendor contract negotiations, quality assurance, and business partner relations.

### SYSTEMS SUPPORT MANAGER

Will manage UNIX, AS/400, and networking systems engineers that manage and plan the development and maintenance of software used by multiple users including application system developers. Experience with the above as well as Windows 95 and NT preferred.

Our \$500+ million organization offers a full line of custom baskets: an exclusive line of Woven Traditions pottery and dinnerware; beautiful fabric accessories, Woodcrafts dividers and lids; and wrought iron products. More than 36,000 independent Sales Associates across the nation market and sell Longaberger Products through home shows.

We firmly believe that stimulating a better quality of life in the workplace is the right thing to do. Employees are offered a comprehensive benefits plan including an on-site Employee Health Center and Family Center for child care. If you possess the above qualifications, please send or fax your resume to:

The Longaberger Company, Attn: Senior Recruiter-KG, Dept. CW,

P.O. Box 73, Dresden, DE 4821-0073, FAX: (614) 828-4029.

An Equal Opportunity Employer

STIMULATE  
A BETTER QUALITY  
OF LIFE

### CONTRACTORS

#### ALL TECHNICAL SKILLS

##### NATIONWIDE REQUIREMENTS

We need your resume to brokers nationwide. Please fax or mail to:  
Send your resume to:

**JKL Enterprises, Inc.**  
500 Avenue C, Suite 108  
Charlottesville, NC 22902

or

1422 K Street NW, Suite 167  
Washington, DC 20004

1-800-257-0945

(301) 468-6571

FAX: (301) 468-7023

www.klenterprises.com

**Integrated Systems Professionals**  
A Fast-Growing National Consultancy Offers Exciting Opportunities For Top Quality Professionals.

**Project Managers**  
**Team Leaders/Consultants**  
• Short Term or Long Term Contract Opportunities

Experience in all SAP R/3 Modules Basis and ABAP  
Oracle • PeopleSoft • IBM

Performance-Based Compensation provides exciting opportunities for individuals with 3+ years experience (to \$250K DR \$150 per hour for experienced SAP experts)

Please fax resume to 516-425-0740  
or email us at <http://www.ipr.com>

**IPR INC.**



# THE TOOLS TO SHAPE AN ENTIRE MARKET... AND IMPACT THE ENTIRE BUSINESS WORLD.

### DIRECTORS

### PRODUCT MARKETING

Positioning. Requirements. Financial Applications/Models.

Market Research. Market Analysis.



Let **COMPUTERWORLD**  
help with your  
**I.T. salaries**

The industry's most authoritative resource  
for setting I.T. salaries is now available on disk.

Computerworld's 10th annual  
**Salary Survey** on disk  
reveals the salaries of  
27 I.T. positions, by  
21 industries and  
9 regional breakouts.

Also included is  
Computerworld's  
**Skill Survey**

- Learn the premiums I.T. managers are paying for specific I.T. skills.
- How are full-time and contract workers being paid for the same skill?
- Which skills are in the highest demand?
- Over 80 skills are listed including languages, development tools, client/server applications, system software, groupware, networking and more. Each broken out by 20 industries and 9 geographic regions.



price: **\$349**

to order, call **1-800-500-7460**

For information on  
advertising,  
call 203-857-5100

# Marketplace

## NEW & NOTABLE

### Network-1 Awarded Internet & Electronic Commerce Award for Best Intranet Solution

Network-1 Software and Technology, Inc., a leading provider of security products and consulting services, announced today that it received the Internet & Electronic Commerce (IEC) Award in the category of "Best Intranet Solution" for its flagship product, FireWall/Plus® for Windows NT. The award recognized Network-1 for successfully implementing an intranet-based strategy throughout the enterprise. In accepting the award, Network-1 president Bob Russo stated, "We are delighted

to accept this honor from the IEC, which recognizes our FireWall/Plus for Windows NT as a robust network security solution. As organizations increasingly look to the Internet and intranets for information, the issue of security is paramount." FireWall/Plus for Windows NT, which was released in December 1996, is a high-performance, high-speed, multi-protocol firewall. As a company's network grows, both in size and complexity, the FireWall/Plus product and Network-1's "FireWall/Plus

Premier Service" hardware/software/sup-  
port offering, is uniquely positioned to  
handle all aspects of the company's secu-  
rity policy and its proper administration.  
Scalability and flexibility enables a quick  
response and adaptation to ever changing  
needs while ensuring the security of the  
entire enterprise.

FireWall/Plus operates at the application,  
circuit, frame (LAN), and packet levels. It  
achieves security above and beyond other  
firewalls by simultaneously filtering traffic

at any layer of the communications archi-  
tecture for any protocol (e.g. IP, IPX,  
AppleTalk, NetBEUI, DECnet, SNA, OSI,  
XMS, etc.) or any application. The security  
solution offers powerful protection to  
Internet and intranet users.

FireWall/Plus has been certified by the  
National Computer Security Association

(NCSA) labs.  
For more information about Network-1 and  
FireWall/Plus, visit <http://www.network-1.com> or call (800) 638-9751/NETWK1.

### "Intranet and Project Management Distance Learning Courses to be Offered by Award-Winning ISIM University"

ISIM University, an award winning provider of corporate education programs, announces three new courses available for delivery direct to the desktop via the Internet: Integrating Intranet Technology Into Your Organization, Project Management Essentials and Project Management Tools & Techniques. Each of these interactive courses provides participants with opportunities to apply their learning on-the-job with assistance from expert facilitators and fellow

class participants.

Integrating Intranet Technology Into Your Organization will develop participants' knowledge and essential skills for designing, implementing, and managing an intranet. Project Management Essentials introduces participants to the fundamental elements of effective project management plus provides participants with the opportunity to apply these elements using real-life exercises and examples.

Project Management Tools and Techniques introduces PC-based project management tools to participants who understand the essentials of project management, but who wish to apply specific tools to effectively and efficiently manage small and medium-sized projects. Classes begin in June, 1997. For additional information call Kevin Rendos, at 800-441-4746 or 303-333-4224, FAX 303-336-1144, or email [admissions@isim.edu](mailto:admissions@isim.edu).

# TECHNO

Alaska

TITANIC

JACK

Ford Explorer

**\$25,000 CASH**

Home Electronic

**WIN EVERY WEEK!**

## Computerworld Marketplace TechnoToys Sweepstakes

**April 7**  
TechnoToy:

A mug featuring a cartoon from Rich Tennant, the well-known cartoonist whose humorous work is often seen in Computerworld.

Win one of 50 mugs being given away!

By entering into the weekly TechnoToys giveaway, your name will automatically be entered into the year-end Super Prize sweepstakes where you could win as much as \$25,000 in cash!

**COMPUTERWORLD**  
The Weekly for Information Technology Leaders

Fax this completed form, or all of the following information to: (800) 898-2299.

Yes, I want to enter to win a Rich Tennant cartoon mug. Please also enter me in the end-of-year 1997 Super Prize Sweepstakes Drawing.

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

email: \_\_\_\_\_

Are you currently a Computerworld subscriber?

yes  no

Issue Date: 4/7/97

No purchase necessary. All entries must be received no later than 11:59 am (EST) Mon, April 14, 1997. Winner will be determined in a random drawing on or about 5:00 pm (EST) Mon, April 14. See the following page for official rules.



For information on  
advertising,  
call 203-857-5100

## Marketplace

***Computerworld Marketplace  
advertising definitely gets the right  
companies to call. We consistently  
receive top-quality leads and typically  
convert over 10% into sales contracts.***

Arthur Drake  
President  
Lorraine Drake  
Executive Vice President  
ALICOMP, Inc.

Reach over 909,000 iT purchase influencers every week and experience for yourself the same success ALICOMP has had by advertising in Computerworld Marketplace! Call for more information (203) 857-5125

**COMPUTERWORLD**  
the authority for information technology leaders

# yes!

*I want  
to reach  
over  
909,000  
potential  
buyers!*

Please send me a Computerworld Marketplace media kit.

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

Fax \_\_\_\_\_

Email \_\_\_\_\_

*Fax this form to (203) 838-1425, or call (203) 857-5125  
and we'll mail you your information right away!*

**COMPUTERWORLD**  
the authority for information technology leaders

## ADVERTISERS INDEX

ADP	29	Lotus Development Corp.	26-27
http://www.adp.com		(Boo) 343-5414	
Amdahl	73	MaxStrat	10
http://www.amdahl.com		McFee	54
American Power Conversion	40-41	McI	25
http://www.apcc.com		Micron	42
888-289-APCC		Microsoft	11, 79
AMP Inc.	13	Network Computing Devices	17
http://www.amp.com		Nokia Display Products	43
Bay Networks	65	Oracle Corp.	7
http://www.baynetworks.com		Peritus	68
Cisco	36-37	Powersoft	15
http://www.cisco.com		Red Brick	20
Compaq Computer Corp.	58-59, 80	SAS Institute	C3
http://www.compaq.com		Seagate Software	24
Computer Associates	5, 18-19	Silicon Graphics	61
http://www.cai.com		Softbank	114
Computer Museum	76	Standard Microsystems	57
Data General	71	Sun Microsystems	21, 45, 47, 67
http://www.dg.com		Toshiba	86
Digital Equipment Corp.	22-23	Xerox	39
http://www.digital.com		http://www.xerox.com	
Eastman Software	48		
http://www.eastmansoftware.com			
EMC Corp.	30-31		
Expsoft	60		
http://www.emc.com			
Gateway 2000	Gi-G3		
http://www.gateway2000.com			
IBM	C4		
http://www.ibm.com			
ICE	33		
Imation	112		
http://www.imation.com			
Innovation Data Processing	9		
http://www.innovationdp.fdr.com			
Intel	50-51		
http://www.intel.com			
International Oracle Users	66		
Group-Americas			
http://www.ioug.org			
Lawson Software	53		
http://www.lawson.com			
(800) 477-1357			

\* Enterprise Networking Select Edition  
+ VAR/Integrator/Consultant Select Edition

To have your Internet address listed here, please contact Paula Wright at (808) 640-7716  
This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

## HAVE A PROBLEM WITH YOUR COMPUTERWORLD SUBSCRIPTION?

We want to solve it to your complete satisfaction, and we want to do it fast.

Please write to:

**COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43350-2043.**

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and phone line as it appears on your label. Send this along with your correspondence.

## Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line.

Your New Address Goes Here Address shown:  Home  Business

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

## Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: 1-800-552-4433 Outside U.S. call (614) 382-3322. Internet address: [customer@cw.com](mailto:customer@cw.com)

COMPUTERWORLD offers advertisers and other companies to use its mailing list for selected direct-mail solicitations. If you do not want to receive these solicitations, or if you want to remain on the promotion list, please write to the following address: COMPUTERWORLD, Circulation Department, 500 Old Connecticut Path, Framingham, MA 01701.

## COMPUTERWORLD, INC.

CEO/  
President  
Gary J. Beach

Senior Vice President/  
Finance  
Matthew C. Smith

Vice President/  
Human Resources  
Susan C. Perry

Executive Assistant  
to the CEO/President  
Karen Elliott

## COMPUTERWORLD

An IDG Company: The World's Leader in Information Services on Information Technology

## Executive Vice President/Publisher

Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171  
Phone: 508-879-0700, Fax: 508-879-4194

## Vice-President

Consumer Marketing

Gail Odneal

**PUBLISHER'S OFFICE:** Assistant to the Publisher/Executive Assistant/Marketing: Director, Marketing Communications; Mary Doyle, Senior Manager, Marketing Communications; Elizabeth Phillips, Manager, Trade Show & Convention/Audrey Abbott, Marketing Manager/Susan Thaister, Marketing Communications Project Manager/Karen Lesko, Marketing Specialist/Evlyn Dineen, Administrative Assistant/Patty White **CIRCULATION:** Director of Circulation Management/Maureen Burke **PRODUCTION:** Production Director/Christopher P. Cuccio, Production Manager/Beverly Wolf **SALES PROFESSIONAL DEVELOPMENT:** Operations Director/Cynthia Delany **DISTINCTION:** Director, Sales Management/Bob Wescott, Traffic Manager/Pat Walker **INFORMATION SYSTEMS:** Vice President of IS/Walter Crosby

## SALES OFFICES

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171  
Phone: 508-879-0700, Fax: 508-879-0466

## NORTHEAST

Regional Vice President: Steven Deneck, District Managers: Thomas J. Deneck, Victoria Marano, Sales Director/Tommy Borsert, Sales Associates: Karen Besley, Dianne McNeil, Cheryl Stratton, 470 Totem Pond Rd., 5th Floor, West Palm Beach, FL 33406, Phone: (407) 890-4869, Hearing Impaired: (800) 448-8484

## MID-ATLANTIC

Regional Vice President: James Husses, Senior District Managers: Fred Lashapte, Victoria Gorin, Barry Cherry, Senior Associate: Karen Besley, Sales Associate: Dianne McNeil, Sales Associate: Linda Delarosa, Sales Associate: Susan Kusick, Sales Associate: John Delarosa, Sales Associate: Lusciano, John Redusick, Mack Center 1, 365 Totem Pond Rd., 5th Floor, West Palm Beach, FL 33406, Phone: (407) 890-4869, Fax: (407) 890-4855, Hearing Impaired: (800) 448-8484

## SOUTH ATLANTIC

Senior Vice President: Dennis Hockenberry, Sales Administrator: Jennifer Putnam, Sales Director: Jennifer Putnam, Sales Associate: Holly Lashapte, 470 Totem Pond Rd., Suite 200, Laurenville, GA 30262, Phone: (770) 931-8140, Fax: (770) 931-8141, Hearing Impaired: (800) 448-8484, Mike Sackman, Sales Associate: Mary Calavera, 75 Shadwell Ave., W. Wayne, PA 19087, Phone: (610) 597-4812, Fax: (610) 597-4813, Hearing Impaired: (800) 448-8484, Mike Sackman, Sales Associate: Mark Sackman, 75 Shadwell Ave., W. Wayne, PA 19087, Phone: (610) 597-4812, Fax: (610) 597-4813, Hearing Impaired: (800) 448-8484, Mike Sackman, Sales Associate: Mark Sackman, 75 Shadwell Ave., W. Wayne, PA 19087, Phone: (610) 597-4812, Fax: (610) 597-4813, Hearing Impaired: (800) 448-8484

## WEST

Senior District Manager: Sharon R. O'Brien, Account Executive: Laurie Gomes, 8 N. Michigan Avenue, Suite 3240, Chicago, IL 60601, Phone: (312) 947-8400, Fax: (312) 947-8400

## SOUTHWEST

Senior District Manager: Jennifer Hedges, Sales Associate: Brenda Shigenari, 1401 Dallas Parkway Suite 314, Dallas, TX 75240, Phone: (972) 233-0882, Fax: (972) 231-0001, Hearing Impaired: (800) 448-8484

## CUSTOMER SUPPORT

Customer Service: Toll-Free: 1-800-552-4433, Customer Support Services: Computer Maintenance, Project Control, Help/Readiness, Managing Edits/Peter Boehmer, Graphic Designer/Cal Varnes, 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171, Phone: 508-879-0700, Fax: 508-879-0466

## MANUFACTURER ADVERTISING

Sales Manager/Panels: 80 Washington St., South Norwalk, CT 06854, Phone: (800) 879-1343, Fax: (800) 879-1343

## COMPUTERWORLD INFORMATION MANAGEMENT DIVISION

Vice President/General Manager: Richard Mikita, Vice President/Information Management: Richard Mikita

Computerworld VAR Database: Carol Mullin, National Sales Manager, Account Executive/Sean Wiegand, (800) 879-0466

Computerworld Database East: Regional Manager, Database Services/Linda Clinton, (800) 879-0000, Fax: 800-879-0464

Computerworld Database West: Regional Manager, Todd Herold, (415) 542-0005, Fax: (415) 542-0102

## OFFICE &amp; SPARES CARDS

500 Old Connecticut Path, Framingham, MA 01701-9171, Phone: 508-879-0700

National Accounts Director/Norma Tamburro, Account Executive/Christopher McGuire, Mack Center 1, 365 West

St. Rd., Rochester, NY 14604, Phone: (585) 537-0000, Fax: (585) 537-0000

## INTERNATIONAL SALES OFFICES

500 Old Connecticut Path, Framingham, MA 01701-9171, Phone: 508-879-0700

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Fax: 508-879-4194

Executive Vice President/Publisher: Michael R. Boggs

Computerworld Headquarters: 500 Old

# The Week in Stocks

## Gainers



## Losers



### PERCENT

Peak Technology Group(L)	+40.6	Rav Brick Systems Inc.(L)	+42.7
Compuware Corp.	+40.2	AlphaNet Corp.(L)	+38.5
Computer Associates Int'l.	+39.5	Netcom Corp.	+35.3
Quintel Electronics Corp.	+20.0	Filenet Corp.(L)	+33.1
Microchip Technology Inc.	+12.4	Manugistics Inc.	+23.1
America On Line	+12.4	ComputerVision Corp.(L)	+26.8
EMC Corp.	+11.2	System Software Assoc.(L)	+25.0
Protron Inc.	+10.1	Shiva Corp.(L)	+23.1

### DOLLAR

America On Line	\$ 5.63	IBM	\$ 8.00
Gateway 2000 Inc.	\$ 5.13	Red Brick Systems Inc.(L)	\$ 6.63
StorageTek Technology	\$ 4.00	AlphaNet Corp.(L)	\$ 5.88
Intel Corp.	\$ 3.44	Netcom Corp.	\$ 5.88
EMC Corp.	\$ 3.48	Filenet Corp.(L)	\$ 5.12
LSI Logic Corp.	\$ 3.25	Manugistics Inc.	\$ 5.00
Western Digital Corp.	\$ 3.75	ComputerVision Corp.(L)	+26.8
Compuware Corp.	\$ 3.72	System Software Assoc.(L)	+25.0
		Shiva Corp.(L)	+23.1

### INDUSTRY ALMANAC

## Exabyte seeks safe perch

**T**wo financial analysts say they are hopeful about the future of Exabyte Corp. (Nasdaq: EXBT), the world's largest independent maker of tape storage devices.

Their enthusiasm is based largely on Exabyte's Eagle Nest, a recently unveiled desktop docking bay for detachable tape or floppy drives. It helps expand the company's range beyond high-end backup tape drives and libraries for major enterprises to workgroups using desktop PCs, the analysts say.

"I haven't seen anything like Eagle Nest, which gives unlimited storage for limited desktop space and helps the office user go back and forth to home," says Richard Baldry, an analyst at Olds Discount Corp. in Detroit.

One factor that held back Exabyte revenue late last year was limited production of 8mm tape recording heads by its German subsidiary, Exabyte Magnetics GmbH, according to Baldry and Bryan K. Stevens Jr., an analyst at H. G. Wellington in New York.

The same issue has plagued the storage industry in recent months, but in Exabyte's case it clearly hampered several millions of dollars of potential sales, Stevens says.

In its fourth-quarter 1996 report, the company cited the shortage as one reason behind a loss of 9 cents per share. Exabyte Chairman Peter Behrendt also cited soft demand for products, high operating expenses and a bad debt charge.

Exabyte, based in Boulder, Colo., finished the last quarter with revenue of \$360 million, down from \$371 million in the same period in 1995. For 1996, revenue was \$1.63 billion, down from \$1.74 billion in 1995. Earnings, nonetheless, were positive in 1996 and negative in the previous year.

Inconsistent earnings concern Stevens; he says he recalls when the stock sold for \$41 in the early 1990s — nearly double its highest value in the past year. — Matt Hamblen

### LOOKING UP?

#### Exabyte stock performance



### Exch: NYSE S&P 500 FOMC

### Amex 4 S&P 500 FOMC

### Nasdaq 4 S&P 500 FOMC

### OTC 4 S&P 500 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### Exch: NYSE S&P 500 FOMC

### Amex 4 S&P 500 FOMC

### Nasdaq 4 S&P 500 FOMC

### OTC 4 S&P 500 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

### Communications and Network Services

### OTC 4.57% FOMC

### Amex 18.75 2.95 FOMC

### NYSE 20.00 3.00 FOMC

### S&P 21.00 3.00 FOMC

### Nasdaq 21.00 3.00 FOMC

### OTC 21.00 3.00 FOMC

# How to contact Computerworld

## TELEPHONE/FAX

Main phone number (508) 879-0700  
 All staff members can be reached via E-mail on the Internet using the form:  
 Firstname.Lastname@cw.com

Main fax number (508) 879-8931  
 24-hour news tip line (508) 820-8555

## E-MAIL

Our Web address is [www.computerworld.com](http://www.computerworld.com). All staff members can be reached via E-mail on the Internet using the form:

Firstname.Lastname@cw.com

All IDC News Service correspondents can be reached using the form:  
 Firstname.Lastname@idg.com

## LETTERS TO THE EDITOR

Letters to the editor are welcome and should be sent to:  
 letters@cw.com

Please include your address and telephone number.

## MAIL ADDRESS

PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701

## SUBSCRIPTION/BACK ISSUES

Phone (800) 669-1002  
 E-mail circulation@cw.com

Back issues (508) 820-8129

## REPRINTS

Phone Michelle Oik, (508) 217-7874

## CONTACTING CW EDITORS

We invite our readers to call or write with comments and ideas. It is best to submit ideas to one of the department editors as well as to the appropriate beat reporter.

Editor Paul Gillin (508) 820-7754  
 Executive Editor Marilyn Johnson (508) 820-879

### OPERATIONS EDITORS/NEWS

News Editor Patricia Kefle (508) 820-8183

Sectional Editor Kevin Fogarty (508) 820-8465

Assistant News Editor Michael Goldfarb (508) 820-8787

Associate News Editor Johanna Ambrosio (508) 820-8533

Online News Editor Judith H. Bernstein (516) 666-1863

Associate News Editor Mitch Betts (508) 820-8718

### SENIOR EDITORS/NEWS

Groupware, E-mail, messaging Barb Cole-Guthrie (508) 820-8883

LANs, operating systems Laura Ohr (508) 820-8182

Network/systems management Sharon O'Brien (517) 944-5485

Application development Steve D'Amato (508) 820-8182

IS management David L. Johnson (508) 820-8780

IT careers Julia King (508) 820-7599

Investigative reporter Kim S. Nash (516) 714-5822

Apple, software issues Ula Pascual (510) 347-0955

Database Craig Stedman (508) 820-8182

Midrange, mainframe Bob Wallace (508) 820-8220

Unix operating systems Mitch Wagner (415) 545-5113

Electronic commerce, Internet Intermarket (508) 820-8184

### SENIOR EDITORS/FEATURES

Mobile computing, social issues Mindy Bledgett (508) 820-8168

PCs, servers, networks Apricah Jacobs (508) 820-8311

Security, government Sharron Macichi (508) 820-8321

Mainframes, high-storage Tim Ouellette (508) 820-8213

## STAFF WRITERS/NEWS

Stewart Deck (508) 820-8133

Kim Conrad (508) 820-8132

Mark Hamlen (508) 820-8367

Intersales

Julian Hubbard (508) 820-8513

Patrick Thibodeau (508) 820-8143

Randy West (508) 820-8365

Client/server, Web

Uva Wang (510) 545-5815

### OPINIONS

Technical Editor Charles Babcock (415) 545-5373

Column Editor Mitch Betts (508) 820-8718

Staff Columnist Frank Hayes (508) 820-8100

### DEPARTMENT EDITORS/FEATURES

Technology review James Connolly (508) 820-8144

Buyer's Guide

### SENIOR EDITORS/FEATURES

Buyer's Guide Cathleen Cagle (508) 820-7779

Casey Davis (508) 820-8186

In Depth Steve D'Amato (508) 820-8182

Management David L. Johnson (508) 820-8780

Marketing Alan E. Alter (508) 820-7714

Special reports Gary in Antnes (508) 820-8154

### ASSOCIATE EDITORS/FEATURES

Managing Best Buy (508) 820-8118

### ICD NEWS SERVICE CORRESPONDENTS

Peru bureau Jeanette Barone (511) 3-1904-8001

Toronto Bureau (416) 89-81-6057

UK correspondent Karen Eustice (416) 6-7-6071

Hong Kong Bureau chief Jim Shilling (508) 233-4666

Taipei correspondent David C. Lin (508) 820-8223

Taiwan Bureau (508) 62-600-6232

## RESEARCH

Bob Fink, senior research manager (508) 820-816; Kevin Barden, senior researcher; Laura Hunt, research analyst; Amy Malone, assistant researcher; Stefanie McLean, senior graphics coordinator; Matt Keefe, online researcher.

## CORE OS/400

Ellen Fanning, managing editor (508) 820-876; Acacia Maguire, Jamie Eskin, copy editors; Michelle Davidson, Kimberly Collier, senior production copy editors; Pat Hyde, David Ramel, Jeremy Selvyn, Kent Shaw, copy editors; Scott Burnell, Monica Sambatra, online copy editor.

## GRAPHIC DESIGN

Tom Morahan, design director (508) 820-8181; Jane Genessee, Mitchell J. Hayes, Nancy Koval, senior graphic designers; Carol L. Lab, photo researcher/editor; Amy Haner, David Waugh, Mary Beth Welsh, graphic designers; Rich Tarrant, Jerry Klosanek, cartographers.

## ADMINISTRATIVE SUPPORT

Linda Gorgone, office manager (508) 820-8167; Connie Brown (ext. 518); Lorriana Witzel (ext. 519); Rita Jones (ext. 512); editorial assistants: Chris Flanagan, West Coast representative; Leanne A. Lewis, assistant managing editor; Leanne A. Lewis, assistant managing editor; and online coordinator, Stephanie Faucher, art director.

## COMPUTERWORLD MAGAZINE GROUP

(Includes Premier 100, Campus Edition, Best Places to Work, Leadership Series, Internet Series, Emergence and Health Care Journal.)  
 Alan Alper, managing editor; Greg Brandel, executive editor; Anne McCay, Catherine McCrory, Joyce Chuchran Ferraro, managing editors; Kimberly A. Smith, assistant managing editor and online coordinator; Stephane Faucher, art director.

## COMPANY LIST

Computerworld is our World Wide Web site. On it, we publish daily news and feature stories that supplement our print coverage. We also have special audio features, such as interviews with industry notables, and the @Computerworld Minute, which is an audio version of the day's top news.

## Companies in this issue

Page number refers to page on which story begins. Company names can also be searched at [www.computerworld.com](http://www.computerworld.com).

3Com Corp. 6,20,24	Casio Computer Co. 43	GE Information Services 77	Malison Cast & Electric Co. 207	Peripherals Research Corp. 44	The Burton Group, Inc. 69
Academy of Management Research 13	Catapult Communications International, Inc. 12	Genesys Corp. 116	Markit Corp. 101	Playboy Enterprises, Inc. 12	The Money Corp. 69
Aberdeen Group, Inc. Cover 1	Cigna Corp. 13	General Motors Corp. 4	Managistics Inc. 8	Powerday Software Solutions 12	The Moneycenter 12
Abercrombie, Inc. Cover 1	Cisco Systems, Inc. 6,14,33	Gateway 2000, Inc. 6	Manugistics, Inc. 10	Preference Software 12	The Outourcing Institute 12
Adaptive, Inc. 48	Compaq Computer Corp. 33	Gilbane, Inc. 1	MCI Communications Corp. 4,8	Project Management Institute 12	The Partnership 6
Address-It, Inc. 13	Computer Associates International, Inc. 14	Gilbane, Inc. 1	Mitardian Data, Inc. 6	Primestar Corp. 12	The Timber Group 53
Address-Wesley, Inc. 77	Computer Associates Corp. 6,9	GlobeWest 8	Mitardian Research, Inc. 6	Pyramid Technology Corp. 8	Time International, Inc. 49
Advanced Logic Research, Inc. 6	Computer Associates Test Corp. 17	GlobeWest 8	Mitardian Research, Inc. 10	Radial Target Marketing 12	Time, Inc. 3
Advanced 2C Technologies Co. 8	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 12	Retired Persons Services, Inc. 12	Tire Systems, Inc. 14
Advantage, Inc. 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 14	Rivets Software Corp. 12	Tivoli Systems, Inc. 14
Aeroflex, Inc. 13	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 16	Robotics Corp. 12	Tokio America 12,30
AirNet Networks, Inc. 6,8,10	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 18	Robotics Corp. 12	Tokio America 12,30
Alaris Planar, Inc. 13	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 20	Robotics Corp. 12	Tokio America 12,30
BBN Planar 13	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 22	Robotics Corp. 12	Tokio America 12,30
Ball Mobility Cellular 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 24	Robotics Corp. 12	Tokio America 12,30
Belkin 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 26	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 28	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 30	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 32	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 34	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 36	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 38	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 40	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 42	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 44	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 46	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 48	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 50	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 52	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 54	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 56	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 58	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 60	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 62	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 64	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 66	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 68	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 70	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 72	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 74	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 76	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 78	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 80	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 82	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 84	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 86	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 88	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 90	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 92	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 94	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 96	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 98	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 100	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 102	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 104	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 106	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 108	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 110	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 112	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 114	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 116	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 118	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 120	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 122	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 124	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 126	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 128	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 130	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 132	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 134	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 136	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 138	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 140	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 142	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 144	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 146	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 148	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 150	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 152	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 154	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 156	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 158	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 160	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 162	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 164	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 166	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 168	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 170	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 172	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 174	Robotics Corp. 12	Tokio America 12,30
Bellcore 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 176	Robotics Corp. 12	Tokio America 12,30
BellSouth 1	Computer Associates Worldwide 10	GlobeWest 8	Mitardian Research, Inc. 17		

**Looks like a floppy drive.  
Feels like a floppy drive.  
Works like a floppy drive.**

**(A 120 megabyte floppy drive.)**



**LS-120 technology.**

**The first high capacity storage system compatible with 3.5" diskettes.**

Take a good look at the next PC you buy and make sure its floppy drive has the LS-120 Advantage: hassle-free, high-capacity storage. Only the LS-120 drive can give you 120 MB of floppy capacity, higher performance, and the ability to read and write to the 1.44MB and 720K floppies you use all the time.



LS-120 is the same simple floppy you already know how to use—just faster and roomier—and backed by a consortium of global technology leaders. It's the new standard. No matter how you look at it. Find out more at [www.LS120.com](http://www.LS120.com). Or call us at 1-800-888-1889, ext. 4002.

**LS 120**

**COMPAQ**

**EXABYTE**

**QR TECHNOLOGY**

  
**IMATION**  
Home of 3M Innovation

**maxell**

**MITSUBISHI**

**Panasonic**

**SIEMENS  
NIXDORF**

Circle-pyramid logo is a trademark of Imation. All other trademarks are properties of their respective companies. © Imation 1997.

# Microsoft hones Java strategy

► Virtual machine, class libraries are on tap

By Wylie Wong

**I**N HOPES of stealing some of Sun Microsystems, Inc.'s thunder, Microsoft Corp. last week unveiled its strategy to help software developers create cross-platform Java applications.

Microsoft released a test version of its new virtual machine that runs ActiveX and JavaBeans components together.

The company also released a cross-platform library of graphics and user interface components, such as tool bars, that let developers quickly create Java applications.

The beta version of the virtual machine and the library — called Application Foundation Classes (AFC) — Graphical User

**Because many Java supporters are anti-Microsoft, "Microsoft is dealing with the religious battle of, 'Do you feel good about using Microsoft tools on Java?'"**

— Rob Enderle,

Giga Information Group

Interface Libraries — are available at Microsoft's World Wide Web site at [www.microsoft.com/java](http://www.microsoft.com/java).

In the second half of the year, Microsoft also will release AFC enterprise libraries, which will provide Java application developers with distributed computing services, such as data access, directory services, management and transactions. Nearly 25 companies this week announced Java applications based on AFC.

Rob Enderle, an analyst at Giga Information Group in Santa Clara, Calif., said Microsoft's foray into Java goes against the conventional wisdom that the company would focus on getting developers to create applications with its own ActiveX tools.

"It shows they are extremely

serious about the [Java] platform," Enderle said. "They want to be No. 1 in Java tools. And they are arguably better than anyone else at building tools."

Because many Java supporters are anti-Microsoft, it will be interesting to see if users support Microsoft's Java products, Enderle said. "Microsoft is dealing with the religious battle of, 'Do you feel good about using Microsoft tools on Java?'" he said. "In quality of tools itself, Microsoft's appear to be equal [to] if not better [than] comparable offerings from Sun and Network Communications Corp."

User Steve Morris, a senior software architect at Pictra, Inc. in Sunnyvale, Calif., said the fact that Microsoft released the products has piqued his interest. But, he added, the products so far are limited.

"It needs to have more application framework, like database support and collection classes — the things below the user interface," Morris said. Microsoft officials said those features will be released in later versions.

The virtual machine for Java Version 4.0 for Windows and the Macintosh will be released this summer, Microsoft spokesman James Plamondon said. The virtual machine, which translates Java code on a computer, will support Sun's Java Development Kit (JDK) 1.1 and be included in Microsoft's Internet Explorer 4.0, he said.

New virtual machine versions for Windows CE and Unix are being developed. The company also is creating a version that supports the older release of JDK, Plamondon said.

As part of its Java strategy, Microsoft will also offer a support program for commercial Java application and component developers. The J/Advantage Program will let developers talk with Microsoft's Java development teams online and in Microsoft's marketing efforts. □

Periodicals postage paid at Framingham, Mass., and other mailing offices. Postage under Canadian International Publication agreement #038567. Computerworld (ISSN 0890-8414) is published weekly, except in Canada, as a combined issue for the last two weeks in December by Computerworld Inc., 300 Congress St., Boston, MA 02110. Copyright 1997 by Computerworld Inc. All rights reserved. Where necessary, permission is granted by copyright owner for those registered with Copyright Clearance Center (CCC), provided that the base fee of \$5 per article, plus \$5 per page is paid directly to Copyright Clearance Center, 27 Congress St., Salem, Mass. 01970. Reprints in quantities of 500 or more must be submitted to Computerworld Inc. for permission. Postmaster: Please address all correspondence to Computerworld Inc., 300 Congress St., Boston, MA 02110. Second-class postage paid at Boston, Mass., and at additional mailing offices. Postage paid at Framingham, Mass., and at additional mailing offices. Postage paid at Boston, Mass., and at other places required. Missing issues will be honored only if received within 60 days of issue date. Subscription rates: 33 a copy; U.S. — \$48 a year; Canada — \$10 a year; Central & So America — \$10 (surface); Europe — \$195 a year; all other countries — \$295 a year. Subscriptions call toll free (800) 331-4431. POSTMASTER: Send Form 3529 (Change of Address) to Computerworld, Box 2044, Marion, Ohio 43305.

# Sun to tackle Java's shortcomings

CONTINUED FROM COVER 1

effort to change all that.

Sun is getting ready to extend client-centered Java to the server with technology that is expected by year's end. The company promises a new virtual machine that will make the translated language as fast, if not faster, than native code. And it is tightening the Pure Java criteria to ensure 100% compatibility on every platform.

Those improvements may persuade information systems managers to replace their power-house C++ code on business-critical servers with Java, which until now has been considered the new kid on the block.

"Speed and cross-platform problems have been holding people back from using Java on important applications," said Lee Stephens, a networked computing engineer at BT Networks & Systems, the largest telephone company in Great Britain. "It sounds like it will only be a few months for these issues to be taken care of. Then it will be ready for huge systems. We will start replacing our C++ code

on the servers. We're ready to go all out with Java."

"The speed increase is going to be a huge deal for us," said Amit Bhatiani, a consultant at J. P. Morgan & Co., a New York-based global financial services firm. "That improvement can't happen fast enough for us. That will definitely lead us to using Java more on the enterprise. We couldn't live without the speed."

Bhatiani said J. P. Morgan uses Java for about 5% of its applications, but he added that he expects that percentage to rocket to about 70% in three to five years.

To tackle the nagging speed problem, Sun is expected to deliver the Hot Spot Java Virtual Machine by year's end. Virtual machines translate the Java code to the computer. The virtual machine is being designed to optimize that Java code — removing unneeded text strings, for example — on the fly so that it will race through the computer.

Alan Baratz, president of JavaSoft, the Java-focused divi-

## ON THE HORIZON

**Sun has unveiled plans to advance Java:**

■ **Java for the Enterprise**  
Expected by year's end

■ **Hot Spot Java Virtual Machine**  
Beta due this summer; shipment expected by year's end

■ **Java Foundation Classes**  
Available for download next month

■ **Next version of JDK**  
Due this summer

■ **Following JDK version**  
By year's end

sion of Sun, said the Hot Spot Java Virtual Machine will run code two to three times faster than just-in-time compilers.

The Hot Spot Java Virtual Machine, which is expected to go into beta testing this summer, is slated to ship in the next version of the Java Development Kit.

## EVERYONE'S A CRITIC

Java has taken it on the chin in the past few months; various executives from Microsoft Corp. have vigorously pointed out several problems with Java's cross-platform capabilities. Some fenders differ among platforms, and some graphics will change size and appearance. Critics say that demonstrates that cross-platform capability is Sun's pipe dream.

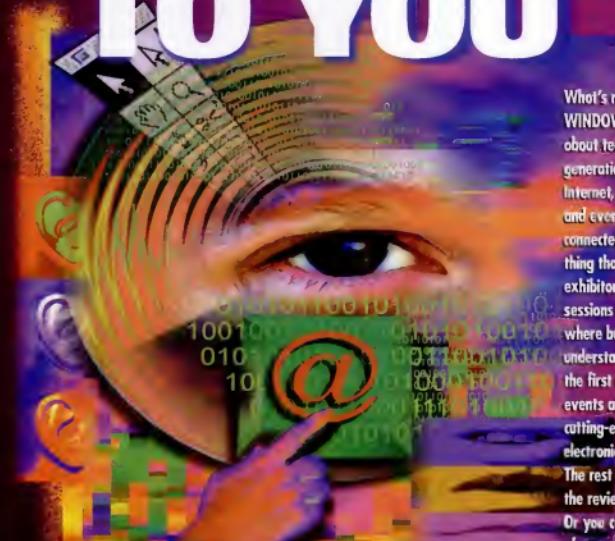
But Sun calls cross-platform capability Microsoft's nightmare. Company officials said Sun is taking care of cross-platform problems by expanding the number of compatibility tests and by releasing a set of Java Foundation Classes that will fix presentation problems.

Kent Williams, a systems consultant at The Money Store in Sacramento, Calif., said those improvements will lure him to Java's camp, but the upgrades can't come fast enough. "The things announced at the conference are needed, but they're not here today. It's still not quite there yet for the enterprise. It will be, and then we'll use it," he said. □



**3** THE TECHNOLOGY CONFERENCE  
EDUCATION-PACKED  
DAYS FOR JUST \$795

# MORE POWER TO YOU



What's new about COMDEX and WINDOWS WORLD is what's new about technology. It's the next generation of network computing, Internet, groupware, Windows NT, and every other technology for connected computing. It's everything that's new from over 1,000 exhibitors, and over 100 conference sessions designed to show you where business, technology and understanding converge. And for the first time, the world's #1 IT events are being held alongside cutting-edge shows in consumer electronics and telecommunications. The rest is up to you. You can read the reviews after it's all over. Or you can turn on the power of convergence right now.

**THE #1 CONVERGENCE EVENT—Where IT, telecommunications and consumer electronics come together.**

 **COMDEX**  
Spring '97

Now held alongside

 **WINDOWS  
WORLD '97**

 **SPRING  
CES**

 **EXPO  
COMM  
USA '97**

**JUNE 2 – 5, 1997 • GEORGIA WORLD CONGRESS CENTER • ATLANTA, GEORGIA**

**GO ONLINE TO REGISTER [www.comdex.com](http://www.comdex.com)**

**Or call 617-449-5554 and enter code 70. Have your fax number ready — we'll fax your registration form within 24 hours!**

**CONFERENCE  
HOTLINE  
617-433-1650**

COMDEX and WINDOWS WORLD trademarks and logos are property of SOFTWARE COMDEX Inc. Spring CES is produced by COMDEX. An Customer Electronics Manufacturers Association and PCMA (Chicago, IL) is the property of MITSUBISHI COMDEX Inc. and C.E. MITSUBISHI Electronics Inc. SPRING CES and the Windows logo are used by MITSUBISHI COMDEX Inc. and C.E. MITSUBISHI Electronics Inc. SPRING CES and the Windows logo are used by MITSUBISHI COMDEX Inc. and C.E. MITSUBISHI Electronics Inc. ©1997 MITSUBISHI COMDEX Inc. • 200 First Avenue, Needham, MA 01999-1722 USA • (617) 433-2300 SP-967 5/97

## COMMENTARY

# Letters, we get letters...

## David Coursey

It's been quite a week. I usually write this column about nine days before you receive it (but I'm not supposed to tell you that). So this is Thursday, and I've spent most of the day explaining to the likes of *USA Today* and The Associated Press that there's nothing particular about being a Web-page designer that would make you and 38 of your friends want to kill yourselves.

Truly, a computers columnist is called upon to explain many things. Some things, like suicide cults, are beyond explanation. Others are much easier to handle. Take me, for example. I find myself easy to explain, even if it can be hard for others to understand. Especially in some of my recent columns about Internet issues.

Many readers have taken me to task over my position that Internet anonymity is a bad thing — that all user accounts should lead back to real users in the hopes of improving online behavior, especially in chat systems and the like. Many readers said it would be easy to

spoof such a system; others said anonymity is an important part of life and ought to be part of the Internet as well.

So to the readers who think the Internet ought to be more like the real world, let me point out that anonymous people can't drive, vote, write a check, open the checking account in the first place, get telephone or electricity service, apply for public assistance, get insurance coverage or (in many instances)

use credit cards. You get the idea; unless you want to live like a hermit in a small cabin/arsenal in the woods, anonymity doesn't really fit in very well. So grow up and accept responsibility for what you do on the Internet. (Yes, I know there are exceptions and limitations, so check out the original column for more details: [www.computerworld.com/search/ATL.html?9702/970210SL0210dc.htm](http://www.computerworld.com/search/ATL.html?9702/970210SL0210dc.htm))

Other readers took great exception to my proposal to enact an Internet access tax of some sort. Most objectors didn't

seem to understand that such taxes have a great place in the history of American telecommunications, and that somebody has to pay for the cost of policing the Internet and providing access to those who otherwise wouldn't be able to gain access.

And I'm not just talking about poor people, but also communities that don't want to be left to rot when the "railroad of the 21st century" bypasses their town. Again, check out the

original column for more details ([www.computerworld.com/search/ATL.html?9702/970210SL0210dc.htm](http://www.computerworld.com/search/ATL.html?9702/970210SL0210dc.htm)).

So I remain firmly convinced of the rightness, even righteousness, of my opinions. I stand even firmer in the belief that everyone is entitled to my opinion. But there is a chink in my armor: I realize I'm acting like a hopeless liberal/romantic and that people will find ways around taxes and their anonymity requirements.

This is the "when guns are criminal, only criminals will have guns" argument. And I am certain that the really bad guys can bypass any law they want — but not 100% of the time, and not forever. Further, honest people won't go through the bother of skating around the law.

The world will never be perfect, but I remain convinced that reducing anonymity and making the Internet pay for itself will make the world a better place. But, of course, I could be wrong. □

*Coursey, an analyst and consultant, is editor of "Coursey.com," an online newsletter available at [www.coursey.com](http://www.coursey.com). His E-mail address is [david@coursey.com](mailto:david@coursey.com).*



## A columnist bids adieu

### Charles Babcock

I'm about to give up my role as watchman on the parapets and venture into the trenches of electronic publishing.

In this final column, I urge you, the stalwarts of the IS staff, to keep your powder dry. Listen to (but don't necessarily yield to) end users. Listen to (but don't always yield to) top business management. No one knows the characteristics of the computing infrastructure as well as IS. No one can decide as effectively how to build for the future, utilizing the resources at hand.

Only the skilled IS professional can navigate the shoals between end users and top management. IS management must not lose its voice in the fundamental organizational decisions being made today.

At the same time, IS has to assume a larger role as systems integrator.

There's no longer such a thing as a safe buying decision. Yesterday's star is today's legacy system. Technology advances on multiple fronts. The proliferation of high-speed PCs created a literate audience looking for a way to link up with other users. From inauspicious be-

ginnings, a set of 20-year-old technologies (Unix, TCP/IP and the PC modem) formed a wonderful confluence known as the Internet.

No single technology is most important. All developments form a kaleidoscope, with different elements slipping in and out of focus. We expect the relentless advancement of Moore's Law. We're also finding Robert Metcalfe's law to be true — that the value of the network goes up geometrically as it extends its reach.

Corollaries will emerge. It will get more difficult to sell things without first having earned standing on the network. Future software giants will start out modestly; they will invent something of value and give it away over the Internet.

In the long shadows of the Gates era, many still believe that individuals domi-

nate technology. Didn't Thomas J. Watson Jr. mold the first modern technology company? Didn't Ken Olsen aptly package the minicomputer? Steve Jobs demonstrated with the Macintosh that technology was still our modern form of magic. And the late genius Seymour Cray single-handedly dominated high-performance computing for a generation.

Alas, it isn't that way anymore. Everything is done by teams, through partners or through licensing agreements. No one party can dominate more than a small slice of the total picture, although Microsoft still insists it can mount the effort. I don't believe its reign will last as long as long as IBM's did.

Behind the figures that make the headlines are teams whose effectiveness determines the competitiveness of their organizations.

Digital, which is something less than a modern icon, spawned a remarkable number of teams. Gordon Bell led the development of the VAX and watched over



David Cutler as he led the development of VMS and later (at Microsoft) Windows NT. One of Cutler's favorite programmers, Roger Heinen, left Digital and migrated to the West Coast and Unix, then Apple, then Microsoft, leaving tracks that reflected the movement of the industry. Digital's downfall may have stemmed from Olsen's inability to hang on to the effective teams that originated there.

But that's yesterday's news. Today's technical whizzes are headed for Java and Internet companies.

Tomorrow's developments will prove the wisdom of developing on a purely object-oriented basis, with discrete modules of software that can message each other across the network. Java, ActiveX and object request brokers are the first tentative steps in that direction.

Somewhere in a garage, or possibly in a distant shanty or tin-roofed hut, there is a young and driven inventor, newly familiar with the building blocks and working on tomorrow's advance. □

*Babcock is leaving Computerworld to become technical editor at Mainspring Communications, Inc., an online resource for Web site developers. He can be reached at [charbock@mainspring.com](mailto:charbock@mainspring.com).*

# alt.cw

Dispatches & images from the fringes of the electronic frontier

## Digital archives



**20 YEARS AGO**  
(APRIL 1977)

**I** The first West Coast Computer Fair is held in San Francisco. Commodore Business Machines unveils its Pet microcomputer, with 4K bytes of RAM and a tape drive, for \$600.

**I** Also at the Faire, Apple introduces the Apple II, with 4K bytes of RAM and a plastic case, for \$1,300. It is the first microcomputer to feature color graphics.

**10 YEARS AGO**  
(APRIL 1987)

**I** IBM overhauls its PC line. The new PS/2 line has a 386 chip, radical 3.5-in. floppy drives, and the Micro Channel Architecture.

**I** IBM and Microsoft announce OS/2.

**I** Microsoft announces Windows 2.0.

**I** Headline: "Lotus sued for VisiCalc infringement."

## Risk assessment

**W**ill your new data center sit on an earthquake fault or toxic waste pit? On Target Mapping in Pittsburgh offers the following map databases to help determine if you're pressing your luck:

- HazWasteInfo and ToxicReleaseInfo: known hazardous waste sites and airborne releases of toxic chemicals.
- QuakeInfo: fault lines and historic records of earthquakes.
- HailInfo, WindInfo, HurricaneInfo and TornadoInfo: records of natural disasters and storms.

The price per database is \$395 per state, \$3,995 for the U.S.

## The Back Page

# Inside Lines

## Ghastly working conditions

Networking consultants gagged recently when they were called in to test the performance of systems and internetworking gear at a university in the Washington area. While troubleshooting gear in the campus computer center, they noticed some dripping from the ceiling. They blanched when they learned the medical school morgue was situated overhead.

## Tandem lifts shadow over Eclipse

Tandem this week will announce new performance clustering capability for Unix-based systems. Code-named Eclipse, the new technology is based on Tandem's ServerNet interconnect architecture, according to a source close to Tandem. The company also is expected to make a Windows NT-related clustering announcement the week of April 28.

## Cabletron licenses IP switching

IP switching will receive a sizable shot in the arm this week when Cabletron Systems announces it will license the technology from Ipsilon Networks. IP switching, launched by Ipsilon in March of last year, was designed to turbocharge router-based IP networks. Cabletron is the largest switching player to date to license the technology. A Cabletron spokesman confirmed plans for the announcement but wouldn't provide details.

## Here comes the Sun king

James Gosling, vice president at Sun Microsystems and inventor of the Java language, is achieving something of a cult-like status. Gosling delivered part of the keynote address the first day of last week's JavaOne conference in San Francisco. When he walked onstage, the crowd of programmers and vendors roared as Sun minions threw limited-edition James Gosling T-shirts — signed and all — into the crowd.

## Microsoft praised as a good Java do-bee

Wondering how Java tastes? You may be able to ask some executives at Sun. After months of verbally lashing out at Microsoft for trying to splinter plans for a standardized Java, Sun executives were pressed during a press conference at JavaOne last week to say exactly how Microsoft is veering away from the standard. The answer: They aren't. Well, not yet, they added. "At this point and time, we are not seeing fragmentation," said Alan Baratz, president of JavaSoft. "All licensees, including Microsoft, are doing what they need to do."

## Company subsidizes at-home surfing

How do you encourage employees from on-the-job recreational Web surfing? Boehringer Ingelheim's animal health division in St. Joseph, Mo., does it in part by subsidizing employees' dial-up Internet connections at home. Workers newly connected to the Infobahn at the office can receive three months of payment for a personal Internet dial-up account, according to Phil Piscotta, IS manager. That would let them explore the Web to their heart's content while not on the company clock. But these days, he says, a lot of the newly wired already have their own accounts and don't need the subsidized connection.

## 'BLACK BOX' FOR CARS

**S**imilar to a jetliner's flight recorder, the DriveRight 130AL from Davis Instruments in Hayward, Calif., keeps a 130-day record of how a car or truck is driven. Fleet managers can download the data to chart speed, starts, stops, braking and accidents. The unit captures data for the 10 seconds just prior to an accident.



## Turn transparencies into polyester pants

The planet is awash in overhead transparencies generated by color printers for presentations. If laid end-to-end, the transparencies discarded annually would circle the globe six times. About 15 million pounds of the stuff ends up in landfills each year. So 3M Visual Systems in Austin, Texas, and Gemark Service in Exeter, Pa., have developed a recycling program that turns the film into polyester. Call (800) 952-4059 to participate.

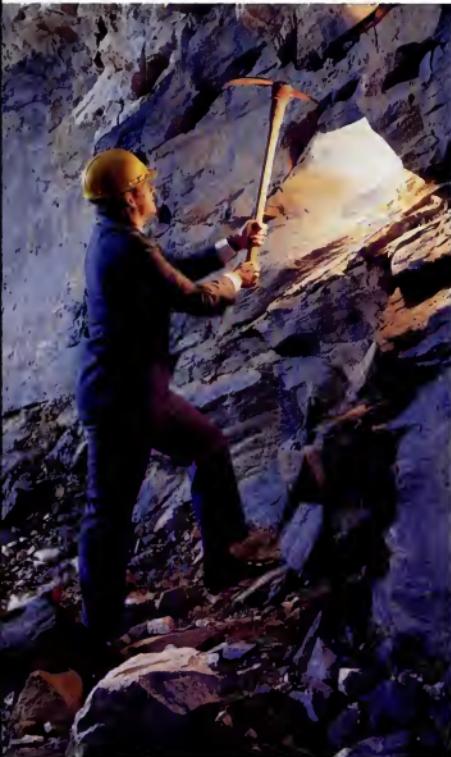
The "Count-Down" watch (\$79.95, Branco International in Kings Park, N.Y.) ticks down to Jan. 1, 2000,



which makes it a nerve-wracking gift for anyone involved in millennium software projects.

If you experienced an energy dip at home or work in January, it may be due to the 450 companies that switched on their R/3 software systems from German vendor SAP AG. Among those flipping the switch were Delmarva Power & Light, Digital, Pennzoil and PSC Scanning. SAP claims this is the most business to go live on its flagship product in SAP's 25-year history. Not all those companies were new installations. SAP said 450 were new, and 200 were migrations from Version 2.2 to Version 3.0. If you are in the midst of an R/3 implementation or have any other news to share, contact News Editor Patricio Keefe at 508-820-8183 or patricio\_keefe@cw.com.

# Discover the Diamonds in Your Data Warehouse



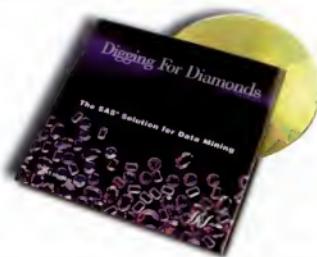
Introducing the first-ever, fully integrated data mining solution...one that maximizes your return on investment in data warehousing and data marts—as decision makers exploit your customer data for competitive advantage.

SAS Institute, for 20 years the leader in data discovery, provides the most complete and reliable data mining solution for modeling, measuring, and enhancing the profitability of your business. This Web-enabled, point-and-click approach lets you employ OLAP, neural networks, churn analysis, and many other visualization and analytical techniques to **improve customer retention, target key prospects, profile market segments, detect fraud, analyze customer response**, and much more.

## Begin Your Discovery with our Free Web-Integrated CD ROM

*Digging for Diamonds: The SAS® Solution for Data Mining* lets you explore data mining from both a business and an IT perspective. And it's linked directly with our World Wide Web site, so you can continue to make new discoveries and gain fresh insights.

To request your copy, visit SAS Institute at [www.sas.com/datamining/](http://www.sas.com/datamining/) or give us a call.



SAS Institute Inc.

The Business of Better Decision Making

E-mail: [cw@sas.com](mailto:cw@sas.com)

[www.sas.com/datamining/](http://www.sas.com/datamining/)

919.677.8200

In Canada 1.800.363.8397



DB2 for Windows NT is the only universal database that can wear this nifty badge.

IBM and DB2 are registered trademarks and Solutions for a small planet is a trademark of International Business Machines Corporation. \*Microsoft, Windows and Windows NT are trademarks of Microsoft Corporation. © 1997 IBM Corp. All rights reserved.



## Is your database missing something? DB2® Universal Database lets you mix

images and other complex objects of sight and sound with traditional data. And add new capabilities at your own pace. From scanned documents to full-up multimedia to interactive training on the Web, no other engine brings data to life on Windows NT\* like DB2.

For a free trial copy, visit [www.software.ibm.com/info/db2nt](http://www.software.ibm.com/info/db2nt) or call 1 800 627-2938, ext. 6C7AK011, and see what you've been missing.

**IBM**

Solutions for a small planet™